Five-Year Review Report

for

Pownal Tannery Superfund Site

Pownal

Bennington County, Vermont

September 2009

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TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY vii

1.0 INTRODUCTION 1-1

2.0 SITE CHRONOLOGY 2-1

3.0 BACKGROUND 3-1

3.1 PHYSICAL CHARACTERISTICS 3-1
3.2 LAND AND RESOURCE USE 3-2
3.3 HISTORY OF CONTAMINATION 3-3
3.4 INITIAL RESPONSE 3-3
3.5 BASIS FOR TAKING ACTION 3-4

4.0 REMEDIAL ACTIONS 4-1

4.1 REMEDY SELECTION 4-1
4.2 REMEDY IMPLEMENTATION 4-1
4.3 OPERATION AND MAINTENANCE 4-3

5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW 5-1

6.0 FIVE-YEAR REVIEW PROCESS 6-1

6.1 ADMINISTRATIVE COMPONENTS 6-1
6.2 COMMUNITY INVOLVEMENT 6-1
6.3 DOCUMENT REVIEW 6-1
6.4 DATA REVIEW 6-1
6.4.1 Residential Wells 6-2
6.4.2 Groundwater 6-2
6.4.2.1 Dean Road Landfill 6-2
6.4.2.2 Mill Building and Woods Road Area 6-3
6.4.2.3 Former Lagoon Area 6-3
6.4.3 Sediments 6-4
6.4.4 Landfill Gas 6-4
6.5 SITE INSPECTIONS 6-5
6.5.1 Former Lagoon Area 6-5
6.5.2 Dean Road Landfill 6-6
6.5.3 Former Mill Building Area 6-7
6.5.4 Woods Road Sloped and Riprap Protected Streambank 6-7
6.6 INTERVIEWS 6-7

7.0 TECHNICAL ASSESSMENT 7-1

7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS? 7-1

7.2 QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES (RAOs) USED AT THE TIME OF REMEDY SELECTION STILL VALID? 7-1
7.2.1 Review of Human Health Risk Assessments and Toxicity Factors Serving as the Basis for the Remedy 7-1
7.2.1.1 Changes in Toxicity 7-3
7.2.1.2 Changes in Exposure Pathways/Assumptions 7-4
7.2.1.3 Evaluation of Recent Sampling Data 7-5
7.2.2 Review of Ecological Risk Assessments and Toxicity Factors Serving as the Basis for the Remedy 7-6
7.2.2.1 Changes in Toxicity 7-7
7.2.2.2 Changes in Exposure Pathways/Assumptions 7-8
7.2.2.3 Evaluation of Recent Sampling Data 7-8
7.2.3 ARARs Review 7-9
7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY? 7-9
7.4 TECHNICAL ASSESSMENT SUMMARY 7-9

8.0 ISSUES 8-1

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS 9-1

10.0 PROTECTIVENESS STATEMENT 10-1

11.0 NEXT REVIEW 11-1

TABLES

TABLE 1. Chronology of Events
TABLE 2. Soil Cleanup Levels
TABLE 3. Maximum Detected Concentrations in Groundwater – Dean Road Landfill
TABLE 4. Maximum Detected Concentrations in Groundwater – Former Mill Building and Woods Road
TABLE 6. Maximum Detected Concentrations in Groundwater – Hoosic River Sediment
TABLE 7. Comparison of 2002/2004 and 2009 Oral Reference Doses and Oral Cancer Slope Factors for Compounds of Potential Concern
TABLE 8. Comparison of Maximum Detected Sediment Concentrations (2005 to 2008) to Historical Maximum Detected Sediment Concentrations
TABLE 9. Comparison of 2001 and 2009 Toxicity Reference Values (Lowest Observable Adverse Effect Levels) for Compounds of Potential Concern with Soil Cleanup Goals
TABLE 10. Comparison of Maximum Detected Sediment Concentrations (2005 to 2008) to Historical Maximum Detected Sediment Concentrations and Sediment Quality Guidelines
TABLE 11. Issues
TABLE 12. Recommendations and Follow-up Actions

FIGURES

Figure 1 Site Locus
Figure 2 Site Area
Figure 3 Dean Road Landfill
Figure 4 Lagoon Area
Figure 5 Mill Building Area

ATTACHMENTS

Attachment 1 List of Documents Reviewed
Attachment 2 Site Inspection Checklist and Photographs
Attachment 3 Interview Records
Attachment 4 Summary of ARARs
Attachment 5 Historical Groundwater Concentrations
Attachment 6 Historical Gas Monitoring Concentrations – Former Lagoon Area

LIST OF ACRONYMS AND ABBREVIATIONS

ACRONYM	DEFINITION
AAL	Ambient Air Level
ARAR	Applicable or Relevant and Appropriate Requirement
AUL	Activity and Use Limitation
AWQC	Ambient Water Quality Criteria
BOH	Board of Health
CAA	Clean Air Act 42 U.S.C. § 7401 *et seq.*
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC § 9601 *et seq.*
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
CWA	Clean Water Act 33 U.S.C. § 1251 *et seq.*
DOT	Department of Transportation
EO	Executive Order
EPA	Environmental Protection Agency (U.S. EPA - Region 1)
ERA	Ecological Risk Assessment
ERED	Environmental Residue Effects Database
ESD	Explanation of Significant Differences
EW	Extraction Well
FDA	U.S. Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act of 1947 7 U.S.C. §136 *et seq.*
FS	Feasibility Study
GWTF	Groundwater Treatment Facility
HQ	Hazard Quotient
ICs	Institutional Controls
IS	Incineration and Stabilization
LNAPL	Light Non-Aqueous Phase Liquid
LOAEL	Lowest Observed Adverse Effects Level
LTRA	Long-term Response Action
M&E	Metcalf & Eddy
MCLs	Maximum Contaminant Levels
MGD	Million Gallons Per Day
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan, 40 CFR Part 300
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Adverse Effects Levels
NPL	National Priority List
O&M	Operation and Maintenance

ACRONYM	DEFINITION
OMEE	Ontario Ministry of Environment and Energy
OU-1	Operable Unit 1
PRP	potentially responsible party
RAC	Response Action Contract
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act, 42 U.S.C. § 6901 *et seq.*
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
RSE	Remedial System Evaluation
SDWA	Safe Drinking Water Act, 42 U.S.C. § 201 *et seq.*
SF	Slope Factor
SQC	Sediment Quality Criteria
SVOCs	Semivolatile Organic Compounds
TBC	To Be Considered
TLV	Threshold Limit Value
TRV	Toxicity Reference Value
UCL	Upper Concentration Limit
VOCs	volatile organic compounds
VTDEC	Vermont Department of Environmental Conservation

EXECUTIVE SUMMARY

This five-year review report, as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), was prepared for the Pownal Tannery Superfund Site (the Site) located between Route 346 and the Hoosic River in Pownal, Bennington County, Vermont. The Site was a former hide tanning and finishing facility owned by the Pownal Tanning Company, Inc. The Site originally consisted of three contamination sources: the former tannery building complex, a capped sludge landfill, and a lagoon system. The United States Environmental Protection Agency (EPA) permanently capped the sludge landfill (Dean Road Landfill) and removed the building complex during a Non-Time Critical Removal Action (NTCRA) that was completed in 2001.

In September 2002, EPA issued a Record of Decision (ROD) that defined one operable unit for the entire site. The ROD specified the excavation and consolidation of tannery lagoon waste, construction of a low permeability cap over the consolidated wastes on site, long-term monitoring of river sediments and groundwater, and institutional controls to protect the cap from disturbance and to prevent groundwater consumption and excavation of waste in the former lagoon area.

The selected remedy for the Site was a comprehensive approach for the tannery site that addressed all current and potential future risks caused by site wastes. At the former tannery lagoons the cleanup prevented direct contact risks with contaminated lagoon waste and significantly decreased further off-site migration that the lagoon sludge could cause through erosion to the adjacent river through flooding events. At the time the ROD was signed it was found that, as a result of the previous removal actions, the soil and sludge contamination in the lagoon area was the only remaining area needing further remediation. Cleanup activities began in July of 2003 and were completed in September 2004. All preliminary construction completion requirements for the Site were met. Specifically, all construction activities that constitute substantial completion identified in the ROD were implemented and a final inspection by EPA and the Vermont Department of Environmental Conservation (VTDEC) was conducted on September 17, 2004.

On September 28, 2007, EPA signed an Explanation of Significant Differences (ESD) to document a modification to the 2002 Record of Decision. Specifically, 1) the extent of the Institutional Controls required for the Site were further characterized and defined, 2) the monitoring requirements for the Operation and Maintenance component of the remedy were detailed, and 3) a determination was made that a limited portion of a protective earthen berm adjacent to the Hoosic River and the new landfill was an integral component of the remedy. The State of Vermont concurred with this determination.

Institutional controls to prevent the use of contaminated groundwater at the Site, and any disturbance of the cap have not yet been implemented. EPA and VTDEC will be working with the current landowners to establish the required institutional controls. Operation and Maintenance activities are being maintained by the VTDEC and there is no evidence that either contaminated groundwater is being improperly used or that there has been any disturbance to the capped contaminants.

A review of the groundwater data collected over the past five years indicates that there has been no increase in groundwater contamination around the two areas of capped wastes at the site. However, additional information needs to be evaluated to determine if contaminated groundwater may be migrating outside of the area currently being monitored for one of the areas, the Dean Road Landfill. Furthermore, elevated groundwater levels were documented in the Former Mill Building/Woods Road Area outside of the areas where waste is being managed in place (the Lagoon area and Dean Road Landfill). This area will be subject to additional evaluation to determine if any additional remedial measures are required.

A review of the sediment data collected over the past five years indicates the remedy continues to be protective with respect to ecological exposure to sediment contaminants.

This is the first five-year review for the Site. The trigger used for this statutory review was the construction completion date of September 30, 2004[1]. Section 121(c) of CERCLA requires that remedial actions resulting in any hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure be reviewed at a minimum every five years to assure protection of human health and the environment. Due to the fact that hazardous substances, pollutants, or contaminants will remain at the Site above levels that allow for unlimited use and unrestricted exposure until remedial actions are completed, EPA has determined that five-year reviews are appropriate for the Site until cleanup goals are attained.

This five-year review concluded that the remedy is functioning as designed and continues to be protective of human health and the environment. However, in order for the remedy to remain protective, the groundwater exceedances in the Former Mill/Woods Road area need to be further evaluated, the potential groundwater migration from the Dean Road Landfill needs to be assessed, and long term institutional controls need to be implemented and enforced.

[1] By statute the trigger date should have been the initiation of remedial action (which would have been September 2003)., but for this Site the construction completion date was inadvertently used (it is an option listed on the model Five-Year Review Summary Form included on page ix). The construction completion trigger date will be retained and the next five-year review will be triggered by this September 2009 five-year review report.

Five-Year Review Summary Form

Site name *(from WasteLAN)*: Pownal Tannery		
EPA ID *(from WasteLAN)*: VTD069910354		
Region: I	**State:** VT	**City/County:** Pownal/Bennington

NPL status: ☒ Final	
Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete	
Multiple OUs?* ☐ YES ☒ NO	**Construction completion date:** 9 / 30 / 2004
Has site been put into reuse? ☒ YES ☐ NO	

Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Leslie McVickar	
Author title: Remedial Project Manager	**Author affiliation:** EPA Region I
Review period:** 10/01/2004 to 9/30/2009	
Date(s) of site inspection: 6/09/2009	
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion	
Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____ ☒ Construction Completion*** ☐ Previous Five-Year Review Report ☐ Other (specify)	
Triggering action date *(from WasteLAN)*: 9/30/2004	
Due date *(five years after triggering action date)*: 9/30/2009	

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]
*** The trigger action should have been the September 2003 start of Remedial Action rather than the Construction Completion date of September 2004, but the September 2004 date will be retained as the trigger date.

Five-Year Review Summary Form, continued.

Issues:

Issues identified at the two landfills are minor and may be addressed during regularly scheduled maintenance events.

Because the Lagoon 2 area displayed detectable VOC concentrations in soil when sampled as part of the Remedial Investigation, and in groundwater monitoring wells in the vicinity of the municipal waste water treatment plant (WWTP) constructed on the capped lagoons, screen future groundwater monitoring data against appropriate federal and state vapor intrusion guidance and criteria. Implement institutional controls for both the landfill and lagoons and continue to monitor.

Potential contaminated groundwater migration from the Dean Road Landfill needs to be assessed and possibly addressed in a future decision document. Groundwater exceedances in the Former Mill Area/Woods Road area, outside of the areas where wastes are being managed in place (Lagoon area and Dean Road Landfill), need to be assessed and potentially addressed in a future decision document.

Protectiveness Statement(s) and Recommendations:

The final remedy at this Site addressed the principal threat remaining by stabilizing the contaminated sludge and by consolidating the stabilized sludge under an engineered cap. The engineered cap protects current and future use receptors from direct contact with the contaminants of concern and was designed to resist flood events. The previous NTCRA established an engineered cap over the Dean Road Landfill which protects current and future receptors from direct contact with contaminants of concern within the landfill. The remedy is functioning as intended by the ROD, as modified by the ESD document, except for: the following matters:

1) Because the Lagoon 2 area displayed detectable VOC concentrations in soil when sampled as part of the Remedial Investigation and in groundwater monitoring wells in the vicinity of the WWTP (MW-L-11 & MW-201), future groundwater data will be screened against appropriate federal and state vapor intrusion guidance and criteria to ensure protection of human health.
2) There are presently no monitoring wells downgradient of the existing monitoring well network at the Dean Road Landfill. All of the existing monitoring wells downgradient of the edge of the landfill indicate contaminant exceedences. Therefore, it is not possible to determine whether contaminated groundwater is migrating beyond this area. This issue needs to be assessed and addressed in a future decision document.
3) Groundwater exceedances in the Former Mill Area/Woods Road area, outside of the areas where wastes are being managed in place (Lagoon Area and Dean Road Landfill), need to be assessed and potentially addressed in a future decision document.

Other Comments: None.

1.0 INTRODUCTION

This five-year review report is for the remedial actions previously conducted and on-going at the Pownal Tannery Superfund Site (the Site). The purpose of this five-year review is to determine whether the remedies for the site are protective of human health and the environment. The methods, findings, and conclusions of this review are documented in this five-year review report. In addition, five-year review reports identify issues found during the review, if any, and present recommendations to address them.

EPA Region I conducted this five-year review pursuant to the CERCLA and the National Contingency Plan (NCP), 40 C.F.R. Part 300. Section 121(c) of CERCLA, 42 USC § 9621(c) states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The Pownal Tannery Site consists of one operable unit (OU-1), which addresses remediation of the entire site. The remedy set forth in the OU1 ROD includes the excavation and consolidation of tannery lagoon waste (sludge), construction of a low permeability cap over the consolidated wastes on-site, long-term monitoring of river sediments and groundwater, and institutional controls to prevent residential development, groundwater consumption and excavation of waste in the lagoon area. The remedy also encompasses the maintenance of a landfill cap and long-term monitoring, as well as the establishment of institutional controls, at an area of the Site remediated under a previous non-time critical removal action (NTCRA) – the Dean Road Landfill.

This is the first five-year review for the Pownal Tannery Superfund Site. This review is required by statute because the selected remedy will, upon completion, leave hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted

exposure. The trigger for this statutory review is the construction completion date of September 30, 2004[2].

[2] *See footnote 1.*

2.0 SITE CHRONOLOGY

The chronology of the Site, including all significant site events and dates is included in Table 1.

3.0 BACKGROUND

Figure 1 shows the location of the Site. The Pownal Tannery Superfund Site consists of a 28 acre set of parcels located between Route 346 and the Hoosic River in Pownal, Vermont, which is in the south-western corner of the State. The Site was a former hide tanning and finishing facility owned by the Pownal Tanning Company, Inc. The Site has been inactive since 1988, when the company declared bankruptcy. The Site originally consisted of three contamination sources: the former tannery building complex, a capped sludge landfill (the Dean Road Landfill) and a lagoon system. EPA permanently capped the landfill and removed the building complex during a non-time-critical removal that was completed in 2001.

3.1 PHYSICAL CHARACTERISTICS

Figure 1 shows the location of the Pownal Tannery Site in Pownal, Vermont, approximately 20 miles southwest of the City of Bennington, Vermont at 42° 47' 49.8" north latitude and 73° 15' 56.7" west longitude. The area surrounding the Site is a rural and residential community with approximately 3,500 residents. The nearest residences are approximately 200 feet from the former lagoon area. These residences rely upon groundwater from private wells for their water supply.

Figure 2 presents a map showing the site boundary and the areas of concern. The Site consists of four properties, three of which are owned by the town of Pownal and the fourth (the Dean Road landfill), is owned by the former Pownal Tanning Company. The largest of the three Town properties is the northern property which occupies approximately 30 acres. This larger parcel encompasses the Former Tannery Building Area and the Lagoon Area. This property extends south of the hydroelectric dam several hundred feet, is bordered to the east by the Boston and Maine railroad tracks, and is bounded to the west by the Hoosic River. The property extends north a short distance beyond the lagoons and is bordered to the north and east by farmland.

The Lagoon Area consists of the consolidated stabilized sludge lagoons, backfilled former lagoons, wetland areas, a berm along the Hoosic River, a small gravel parking area, and a wastewater treatment plant. A gravel road leads into the area.

The Former Tannery Building Area is a park, covered with grass, pavement and crushed stone. The area slopes down to the river and contains guard railings and remnants of the former tannery building foundation. A small building exists adjacent to the river to shelter the former hydroelectric works that is no longer operational.

Two smaller properties are located to the east and west of the larger property separated, respectively, by the Hoosic River and the railroad tracks. The small western property containing the Woods Road Disposal Area is located on the west bank of the Hoosic River. A pump house and two original Tannery water supply wells are located here, but neither is functional. This property slopes gradually to the river and is overgrown with a layer of riprap placed along the river edge.

The other small property containing the Warehouse Area is located east of the railroad tracks and is bounded to the west by State Route 346. Reportedly, hides were stored in this warehouse and on tables outside of the warehouse. A portion of this property is paved and is used for parking and for truck loading and unloading at the warehouse.

The fourth, privately owned parcel, which is the southernmost property, contains the Dean Road Landfill that was used by the tannery to receive sludge from the clarifier and lagoons. This southern property is rectangular and includes some wetlands and a portion of a pond located downhill (east) of the landfill. The pond and wetland extend further east to the Hoosic River. Residential properties border the landfill property to the north and south, and Dean Road forms the western property boundary. A gravel pit is located across Dean Road to the west.

3.2 LAND AND RESOURCE USE

The former tannery building area was demolished by EPA under a non-time critical removal action that was completed in 2001 and the area is now used by the public for recreation. In the warm weather months, the adjacent Hoosic River is used for recreation as well. EPA and the VT DEC have worked with the town of Pownal to identify future site reuse that would be protective under the site restrictions required by the CERCLA cleanup (as described in the ROD). This coordination has helped to facilitate potential reuse planning and will help ensure that the cleanup is fully protective of current and reasonably-anticipated future land uses. To assist the Town in evaluating reuse options for the Site, the EPA provided the Town with a $97,250 grant in September 1999 to conduct a community-based reuse planning process. The Town summarized the results of that process in a February 2001 report entitled, "Pownal Tannery Superfund Reuse Assessment Report" (Reuse Plan). Since that time, significant progress has been made towards the goal of returning the Site to productive use. As an important step in achieving those goals, the Town acquired the former tannery building complex and former lagoon area in 2002.

For the former lagoon area, the reuse plan recommended both active recreational uses (e.g., playing fields, seasonal skating rink) and passive recreational uses (e.g., trails, canoe/kayak launch, picnic/lawn area). In addition, lagoon #2 was identified as the preferred location for the town's new wastewater treatment plant (WWTP), which was completed in 2007.

Post-remediation view of lagoon area

During the Design Phase of the remedy EPA used this location for a staging area to process soils/sludge from the former lagoons. EPA and the Town's engineers collaborated to make the area suitable for the WWTP once the staging area was no longer needed, and to ensure that construction activities could be done as efficiently and cost-effectively as possible. Funds towards the construction of the WWTP were

provided by EPA ($7.4 million), United States Department of Agriculture ($5.1 million), and VTDEC ($5.3 million).

EPA constructed a low-permeability cap on the former Dean Road landfill in 2001 as part of the NTCRA. The property is currently under private ownership and the Town of Pownal has no plans to acquire it. The reuse plan did not address the reuse of the Dean Road landfill. Operation and maintenance and long-term monitoring of the landfill are currently being undertaken by the VTDEC through an access agreement with the landowner.

3.3 HISTORY OF CONTAMINATION

The former tannery was built in 1866 as the North Pownal Manufacturing Company, and was owned by A.C. Houghton and Co. The Site was originally used to make cotton print cloth. The mill manufactured an estimated five million yards of cotton goods per year. In 1935, the cotton mill was converted to a tannery. The operation consisted of hide cleaning (beaming) using a variety of chemicals (pesticides, solvents), hydrochemical stabilization of the purified leather (tanning) using trivalent chromium, dyeing and lubrication of the tanned leather, followed by pasting and finishing of the leather into a variety of textures and thicknesses for commercial sale.

From approximately 1937 until 1962, untreated tanning process wastewater was directly discharged into the Hoosic River. A lagoon system comprising six lagoons was constructed in several stages between 1962 and 1971 to receive the tannery's wastewater. The lagoon system was operated until 1988. In 1982, the state permitted, Dean Road lined landfill was constructed which received sludge dredged from a portion of the lagoons.

3.4 INITIAL RESPONSE

In 1985, the Vermont Agency of Natural Resources notified the company that they were in violation of state environmental requirements, which resulted in the partial closure of the Dean Road Landfill. The VTDEC issued an Administrative Order in April 1988 requiring additional actions, but by the end of the year, the company declared Chapter 11 bankruptcy and ceased operations.

EPA took a number of cleanup actions in 1993-1994 and again in 1999-2001 to address site contamination involving the building complex and landfill. These actions included the removal of over 13,000 pounds of contaminated materials from the tannery buildings, decontamination of the warehouse, demolition of remaining buildings, removal of underground storage tanks and contents, and capping of the Dean Road Landfill.

The Site was placed on the Superfund National Priority List (NPL) in January 1999. EPA subsequently conducted a Remedial Investigation/Feasibility Study (RI/FS) to determine if additional cleanup was necessary for the lagoon area, surface water/sediment of the Hoosic River and groundwater. In September 2002, EPA selected a final remedy for the Site that entailed the excavation and consolidation of lagoon wastes; construction of a low-permeability cap over the consolidated wastes; long-term monitoring of river sediments and groundwater to assess the protectiveness of the capped lagoons; and institutional controls.

On September 28, 2007, EPA signed an Explanation of Significant Differences (ESD) to document a modification to the 2002 ROD. Specifically, 1) the extent of the Institutional Controls required for the Site were further characterized and defined, 2) the monitoring requirements for the Operation and Maintenance component of the remedy were detailed, and 3) a determination was made that a limited portion of a protective earthen berm adjacent to the Hoosic River and the new capped lagoon landfill was an integral component of the remedy. The State of Vermont concurred with this determination.

3.5 BASIS FOR TAKING ACTION

Table 2 shows the Soil Cleanup levels. Action was taken since the baseline human health assessment revealed that future park child and adult visitors and future adult commercial workers could potentially be exposed to dioxins, mercury, chromium, benzo(a) anthracene, benzo(a)pyrene, pentachlorophenol, arsenic, and N-nitroso-di-n-propylamine in lagoon soil and sludge (lagoons 1,3 and 5) via a direct contact and ingestion exposure. These exposures may present a human health risk in excess of EPA guidelines (e.g., carcinogenic risk = $1x10^{-3}$, HI = 4).

All elevated concentrations of contaminants detected in Hoosic River sediments that resulted in a human health risk exceedence, were detected at higher concentrations upstream of the Site. Therefore, the exceedences of EPA standards for sediments were found to be linked to non-site related discharges or background levels and were, therefore, not a basis for a response action. However, as a result of EPA's concern that future potential town reuse plans may include recreational use of the Hoosic River adjacent to the Site, EPA completed supplemental calculations, using the same methods and assumptions as the baseline risk assessment, to identify the risks to public health from only those sediments downstream of the dam at the Site. The baseline risk calculations included data collected upstream of the dam and Site, which indicated much higher concentrations. The supplemental risk calculations indicated that the cumulative receptor carcinogenic risks are within the EPA risk management cancer risk range of 10^{-6} to 10^{-4}, and non-carcinogenic risks are below EPA's target risk of HI 1

The ecological risk assessment revealed there was an unacceptable ecological risk to benthic invertebrates and a variety of wildlife. The affected wildlife include: the muskrat, spotted sandpiper, little brown bat, raccoon, American woodcock, short tailed shrew, American robin and the deer mouse. Unacceptable exposures to these species of wildlife were caused by dioxins, cadmium, chromium, lead, and mercury in the surface water, sediments, and soil/sludge. To remediate these unacceptable risks, the remedy addressed the contaminated soil, sludge, sediments and surface water in the lagoons through excavation, stabilization, consolidation and capping.

Long-term operation and maintenance activities include groundwater and river sediment sampling to assess the protectiveness of the Lagoon Landfill cap, as well as continued operation and maintenance and long-term monitoring of the Dean Road landfill cap, and a section of river berm under which waste was left in place. These measures will ensure that the remedy remains protective of human health and the environment into the future.

4.0 REMEDIAL ACTIONS

4.1 REMEDY SELECTION

The selected remedy for the Site was published in the 2002 ROD, which included the following components:

- Pre-Construction Activities
- Erosion and Sedimentation Controls
- Construct Staging Area over Lagoon 2
- Clearing and grubbing of Lagoons 1, 2, 3, 4 (southeast portion only) and 5
- Excavation of wastes from Lagoons 1 and 5
- Consolidation of wastes from Lagoons 1 and 5 over Lagoon 3A/B
- Construction of Solid Waste landfill cap over Lagoons 3A/B and 4 (partial)
- Institutional Controls
- Land-use restrictions that prohibit residential use of Lagoon Area aquifer and disturbance of the cap
- Long-term groundwater monitoring to assess the protectiveness of the capped lagoon
- Long-term river sediment monitoring to assess the protectiveness of the capped lagoon
- Remedial Action Operations & Maintenance
- Institutional Control Inspections
- Five-year Site Reviews

In addition, the remedy stipulates that the State of Vermont is responsible for operation and maintenance and long-term monitoring of the former lagoon area and the Dean Road Landfill. Under the 2007 ESD the institutional controls were required for the Dean Road Landfill and the State is also responsible for maintaining the section of berm along the river where waste was left in place.

4.2 REMEDY IMPLEMENTATION

The Site remedy was conducted in two phases and was performed by two separate RA contractors. Phase I included only site preparation activities. Phase II included the activities necessary to complete the remedy. A construction sequence overview and a summary of construction activities and quantities are provided in the Remedial Action Report dated February 2005 (M&E, 2005).

Phase I of the RA included site preparation activities which were conducted in the fall of 2003, from September through early November. The site preparation activities included the following:

- Site access road and entrance improvements;
- Installation of hay bale and silt fence erosion controls around the work areas at the Site;
- Clearing, grubbing, and chipping of trees and brush located around and within the former lagoons to be excavated;
- Abandonment of several existing monitoring wells in and around the lagoons;

- Backfill placement within Lagoon 2;
- Preparation of the proposed waste processing area and lagoon landfill footprint;
- Consolidation of debris within the proposed lagoon landfill footprint;
- Fence dismantling and replacement; and
- Disposal of Lagoon Area asbestos pipe debris off-site.

Phase II of the RA commenced with sludge remediation. Stabilization was necessary to prepare the lagoon sludge for consolidation and compaction in the lagoon landfill. The goal of the sludge stabilization was to increase the shear strength (meet unconfined compressive strength of 10 psi within 3 days) such that standard construction equipment could place and compact the sludge within a relatively short period of time to create the on-site, lagoon waste area landfill. Portland cement was mixed with the sludge in-place (*in-situ*). This method was first demonstrated in a bench-scale test, and then further demonstrated during a full scale run prior to full operations.

Stabilization was generally conducted in a similar manner as in the shakedown demonstrations. Cement was added and mixed in-situ using a customized vented, metal hood (to minimize dust), an excavator, and an excavator equipped with an in-situ power mixer ("Allu" Power Mixer). Water was applied during mixing while continuous air monitoring was conducted. Cement was delivered via tanker truck and pumped through the hood to the surface of the sludge.

The stabilized sludge was excavated and placed in the landfill between May 10, 2004 and July 12, 2004. Excavation was performed in parallel with stabilization, when possible, to accelerate the schedule. The excavated material was placed in all-terrain dump trucks, weighed using on-site scales, and dumped in the landfill. A total of 81,139 tons of stabilized sludge was excavated and transported to the on-site lagoon waste area landfill for consolidation and capping.

The cover system was constructed to permanently cap the stabilized sludge, to control runoff to withstand a river flood event (riprap armoring), and to control migration of potential landfill gas. For the portion of the landfill that faces north and east, the side slopes were constructed with the vegetative support layer and topsoil. For the portion that faces south and west (towards the river), crushed stone and riprap were placed to provide flood protection.

Grass-lined and stone-lined drainages swales and slope-toe drains were constructed as part of the cover system. These components were constructed to control and direct stormwater flow away from the landfill.

Along with the demobilization of equipment and materials, key activities included:

- Topsoil and seed placed within the footprint of the former Lagoons 1 and 5, and along the berm separating these lagoons and the river;
- Riparian buffer zone planting along the river berm;
- Establishment of site access road to and around the landfill;
- Placement of gates and fencing; and
- Modification to the downstream river berm for flood control.

On September 28, 2007, EPA signed an Explanation of Significant Differences to document a modification to the 2002 Record of Decision. Specifically, 1) the extent of the Institutional Controls required for the Site were further characterized and defined, 2) the monitoring requirements for the Operation and Maintenance component of the remedy were detailed, and 3) a determination that a limited portion of a protective earthen berm adjacent to the Hoosic River and the new landfill was an integral component of the remedy. The State of Vermont concurred with this determination.

4.3 OPERATION AND MAINTENANCE

Requirements for operation and maintenance of the remedy are consistent with those of a typical closed landfill. Operation activities are not required, except at the Dean Road Landfill where leachate is collected and periodically disposed of off-site at a licensed facility. Maintenance of the two landfills includes regular mowing of the covers, removal of woody plants, repair of erosion, and repair of storm water controls and gas vents. Additional soil amendments and seeding may be necessary to sustain full grass coverage. In addition, the State also will maintain the section of river berm under which CERCLA waste was left in place.

Regularly scheduled inspections have been performed to confirm that the remedial action elements remain protective of human health and the environment. Environmental monitoring of the RA includes sampling and chemical analyses of site groundwater and sediment around the Lagoon Landfill[3] and groundwater around the Dean Road Landfill[4] and sediment samples from the Hoosic River. Select adjacent residential properties are being sampled annually for tap water quality. Operation and Maintenance activities are being performed by the VT DEC under the terms of a July 2003 State Superfund Contract with the EPA.

The approximate cost of annual O&M activities is $35,000.

[3] The downgradient edge of the lagoon waste management area is the Hoosic River, so sediment monitoring is utilized to ensure contaminated groundwater is not posing a risk at the River. Upgradient of the area groundwater monitoring is utilized. There also is groundwater monitoring within the waste management area.

[4] Although there has been groundwater sampling at the Dean Road Landfill, there has not been monitoring of groundwater downgradient of this area to ensure that contaminated groundwater is not migrating. This matter will be evaluated and any additional remedial measures that may be called for will be addressed in a future decision document.

5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW

This is the first five-year review for the Site.

6.0 FIVE-YEAR REVIEW PROCESS

This section describes the activities performed during the five-year review process and provides a summary of findings.

6.1 ADMINISTRATIVE COMPONENTS

EPA, the lead agency for this five-year review, notified the VTDEC in the winter of 2009 that the five-year review would be completed. The Five-Year Review Team was led by Leslie McVickar of EPA, Remedial Project Manager for the Pownal Tannery Superfund Site and included staff from Metcalf and Eddy and TRC Inc.. Brian Woods of the VTDEC was also part of the review team.

From April 2009, the review team established the review schedule including the following:

- Community Involvement
- Document Review
- Data Review
- Site Inspection
- Local Interviews
- Five-Year Review Report Development and Review

The review was completed during September 2009.

6.2 COMMUNITY INVOLVEMENT

EPA notified the community in a May 2, 2009 public notice, published in a local newspaper, of its review of the progress at the Pownal Tannery Superfund Site. EPA has not received any community comments about this Five-Year Review.

6.3 DOCUMENT REVIEW

This Five-Year Review consisted of a review of relevant documents including decision documents, O&M records, and monitoring reports. The documents reviewed are listed in Appendix B.

6.4 DATA REVIEW

A long-term monitoring program (LTMP) was implemented as required by the ROD. The ROD and LTMP specified on-going monitoring requirements for landfill gas, river sediments, residential wells, and groundwater. A review of the available data was conducted from the past five years for each of these media, as summarized below.

6.4.1 Residential Wells

According to the LTMP, six residences require sampling annually. The samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and select metals (antimony, arsenic, barium, chromium (total), lead, manganese and zinc). In 2004, four of the residential properties were sampled. In 2005 and 2006, two of the residential properties were sampled. In 2007 and 2008, three of the residential properties were sampled.

Long term water quality monitoring data collected since the ROD were evaluated to determine if any significant changes in concentration had occurred since the RI. To date, there have been no detections of VOCs, SVOCs, or metals above State or Federal drinking water standards in the residential wells where samples were collected.

6.4.2 Groundwater

The Hoosic River runs adjacent to the former Mill Building area and the former Lagoon area. The water table elevation maps prepared for the RI, and over the last five years, indicate that all groundwater from the Site discharges to the Hoosic River. At the Dean Road Landfill, groundwater flows from west to east and also flows towards the Hoosic River.

6.4.2.1 Dean Road Landfill

Groundwater samples were collected annually at the Dean Road Landfill from seven locations: MW-101U, MW-103U, MW-103R, MW-B-8, MW-B-7, MW-102U, and MW-B-10. MW-B-9 has not been sampled due to an insufficient water column in the well. Samples were also collected from the onsite leachate tank. All samples were analyzed for VOCs, SVOCs, and target list metals (antimony, barium, chromium, manganese, zinc, arsenic and lead) through the year 2006. Following 2006, samples were only analyzed for target metals. Filtered samples were collected if the final turbidity readings during purging exceeded 10 Nephelometric Turbidity Units (NTU).

Table 3 presents a summary of maximum concentrations of detected compounds for the Dean Road Landfill monitoring wells. VOCs and SVOCs were not detected. There were exceedances of Federal and State drinking water standards for metals: antimony, chromium, lead, manganese, zinc, and arsenic within the landfill area. Based on an examination of the data presented over the past five years, there was no apparent increase in groundwater concentrations over time. There has not been monitoring of groundwater downgradient of the landfill area to ensure that contaminated groundwater is not migrating. This matter will be evaluated and any additional remedial measures that may be called for will be addressed in a future decision document.

In 2004, the leachate accumulation rate was approximately 25 gallons per day (gpd). In 2008, the leachate accumulation rate was approximately 5.1 gallons per day. The steadily decreasing rates with time indicate that the cap is providing an adequate barrier to infiltration. All leachate is being collected and transported off-site to a licensed facility by the State as part of its O&M obligations.

6.4.2.2 Mill Building and Woods Road Area

Groundwater samples were collected at the former Mill Building and Woods Road area from five locations: MW-110U, MW-113R, MW-110R, MW-106U, and MW-112U. Samples were also collected from the outfall, OF-1. The samples were analyzed for VOCs, SVOCs and target list metals (antimony, barium, manganese, zinc and arsenic). Filtered samples were collected if the final turbidity readings during purging exceeded 10 NTU.

Table 4 presents a summary of maximum concentrations of detected compounds for the former Mill Building/Woods Road monitoring wells. There were low level detections of VOCs at one monitoring well, MW-110R: isopropylbenzene (7.9 ug/L), n-Propylbenzene (6.2 ug/L), tert-Butylbenzene (4.2 ug/L) and sec-Butylbenzene (4.8 ug/L). There were exceedances of metals: antimony, manganese and arsenic above Federal and State drinking water standards. The metals concentrations were consistent in magnitude over time. No groundwater risks were identified for this area within the ROD. Therefore, this matter needs to be further evaluated and if groundwater risks are identified any additional remedial measures that may be called for will be addressed in a future decision document.

6.4.2.3 Former Lagoon Area

Commencing in 2005, groundwater samples were collected in the former lagoon area from nine locations: MW-201, MW-203, MW104U, MW-L-4, MW-202, MW-107U, MW-107R, MW-L10, and MW-L-11. Table 2 – Monitoring Intervals and Parameters, presented in the Operation and Maintenance Plan (VTDEC, 2006), included as Attachment C of the Explanation of Significant Differences, states that samples will be collected quarterly for the first two years and will be analyzed for: VOCs, SVOCs, metals, pesticides and dioxins. In years three through five, samples will be collected semi-annually and analyzed for VOCs, SVOCs, and metals (full list) at all nine locations. In practice, after two years of operations and maintenance, the sampling frequency was reduced to annual sampling and analyses was reduced to select metals (antimony, arsenic, barium, chromium (total), lead, manganese and zinc) in all wells and VOCs in three wells: MW-201, MW-202, and MW-203. Additionally, three upgradient monitoring wells, MW-L-7, MW-L-8, and MW-L-9, were to be sampled annually for VOCs, SVOCs, pesticides, dioxins, and metals. After two years of collecting samples, the analyses were reduced to VOCs and select metals. Unfiltered samples were collected from all the monitoring wells for total metals analyses. Filtered samples were collected if the final turbidity readings during purging exceeded 10 NTU.

Table 5 presents a summary of maximum concentrations of detected compounds for both the upgradient and former Lagoon Area monitoring wells. Only one VOC was detected above current Federal and State drinking water standards. At MW-L-11, within the Lagoon Area, chloromethane was found at a concentration of 1,000 ug/L during the July 2006 sampling event. There were two exceedences of the SVOC bis(2-ethylhexyl)phthalate at MW-201 (15 ug/L) and MW-107R (16 ug/L) within the Lagoon Area. There were no exceedences of the standards for pesticides. There was one exceedence of total 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) equivalence at MW-107U (0.000031 ug/L) in the Lagoon Area. There were frequent exceedences of the Federal and State drinking water standards for metals including aluminum,

iron, magnesium, and arsenic within the Lagoon Area. Similar concentrations of metals were observed in samples from upgradient wells. Manganese was detected at concentrations above the Federal and State standards in unfiltered samples collected from upgradient wells MW-L-8 and MW-L-9. Over the four years of data collection, the concentrations of contaminants did not fluctuate. The western boundary for groundwater contamination is the Hoosic River. Sediment sampling in the river indicates that groundwater contamination in the Lagoon Area is not discharging to the river and causing an adverse affect. See Attachment 5 for historical groundwater concentrations.

6.4.3 Sediments

Commencing in 2005, sediment samples were collected from the Hoosic River from five locations annually: SD-30, SD-31, SD-34, SD-36, and SD-37. SD-31, SD-34, SD-36 and SD-37 are located along the river bed adjacent to the former lagoon landfill. SD-30 is located upgradient. Figures 2.2-1 and 2.3-1 from the RI show these sample locations. For the first two years, the following analytical tests were performed: VOCs, SVOCs, Target Analyte List (TAL) metals, dioxin, pesticides and polychlorinated biphenyls (PCB) homologues. The program was then reduced to TAL metals and PCB homologs, but the VTDEC intends to sample for SVOCs during future sampling events.

Long term sediment quality monitoring data collected since the ROD were evaluated to determine if any significant changes in concentration had occurred since the RI. Table 6 presents a comparison of maximum concentrations detected in the long-term monitoring samples to groundwater quality standards. There were six SVOC compounds present in sediment samples that were above ecological risk standards for sediments: phenanthrene, fluoranthene, pyrene, benz(a)anthracene, chrysene, and benzo(a)pyrene. All of those compounds were present at SD-37. Only fluoranthene and pyrene were present above sediment ecological risk standards at locations SD-31, SD-34 and SD-36. SD-30 only had an SVOC detection of fluoranthene. For metals, concentrations exceeded sediment ecological risk standards at all locations at least once over the five year period for iron and nickel. Exceedences of copper accorded at all locations except SD-30. Over the four years of sample collection, the concentrations remained consistent in magnitude with time. As stated in Section 6.4.2.3, the sediment data collected through the O&M sampling program indicates that Lagoon Area groundwater contamination is not migrating outside of the area and has not adversely affected the Hoosic River. Sediment data will continue to be collected and evaluated annually to ensure that the remedy is protective. Historical concentrations are presented in Attachment 5.

6.4.4 Landfill Gas

In order to ensure that harmful gases are not being released to the atmosphere, gas discharge rate measurements and contaminant levels were measured at least annually at each point of discharge, according to the gas monitoring sampling and analysis plan presented in Attachment C of the Explanation of Significant Differences. The primary contaminants of concern are methane and hydrogen sulfide. The Lagoon Landfill has five gas vents, GV-1 through GV-5, located on the top of the landfill and three gas probes, GP-1 through GP-3 around the perimeter. The Dean

Road Landfill has three gas vents. In 2005, the gas vents in the Lagoon Landfill were modified with extensions to make the outlets less accessible to visitors.

Gas discharge rate measurements were collected using a bubble meter connected to the gas vent. Atmospheric pressure was measured at an offsite location, the Bennington Morse State Airport. Gas characteristics were determined using a photoionization detector and multi-gas meter configured for methane and hydrogen sulfide.

In 2005, measurements were taken four times at the Lagoon Landfill and once at the Dean Road Landfill. In 2006, measurements were taken twice at the Lagoon Landfill and once at the Dean Road Landfill. In 2007 and 2008, measurements were collected annually at both locations. Actual flow rate measurements were not provided.

At the Dean Road Landfill, from 2005 to 2008, no measurable flows were found in any of the three gas vents. At the Lagoon Landfill, measureable concentrations of hydrogen sulfide were obtained on June 30, 2005 at gas vents GV-1, GV-3 and GV-4. No other measurable levels of hydrogen sulfide were found on any other day over the four years (2005 through 2008) of monitoring. Therefore, no response measures for landfill gas emissions are necessary.

6.5 SITE INSPECTIONS

On June 9, 2009, Jose Ramos, Senior Engineer from M&E/AECOM and Amy Hamilton, Project Engineer from TRC, visited the Pownal Tannery Superfund to conduct the scheduled inspection of the former lagoon area. In addition, the following facilities were inspected:

1. Dean Road Landfill
2. Former Tannery Building Area
3. Woods Road Disposal Area

Photographs taken during the inspection are presented in Attachment 2.

6.5.1 Former Lagoon Area

In general, the landfill was found to be in very good condition. Even though tall vegetation hindered inspection of the landfill cap (see Photos 1 and 2), there appear to be no visible signs of structural damage such as differential settlement, localized depressions, excessive erosion or slope instability. Except for vegetation growth, perimeter ditches and culverts were unobstructed and there was no evidence of sedimentation (see Photos 3, 4 and 5). The five gas vents were in good working condition with no evidence of damage (see Photo 2). The groundwater monitoring wells were all capped and locked (see Photo 6). The fence along the perimeter access road and along the boundary with the wastewater treatment plant was in excellent condition (see Photos 5 and 11). The following maintenance related issues were identified:

1. The landfill does not appear to have been mowed this year (see Photos 1 and 2). The landfill should be mowed twice a year as stipulated in the O&M Plan.

2. Vegetation is growing through the riprap and ditches at several locations (see Photos 3 though 5). The ditches and riprap stabilized slopes should be cleared of vegetation to prevent long term displacement of riprap or stones.

3. Two animal burrows were observed along the edge of the landfill crest, one just above Culvert No. 2 (see Photo 7), the second one at mid-point between GV-4 and GV-5 (see Photo 8). Animal control should be implemented in accordance with the O&M Plan.

4. Entrance to the landfill is gated (see Photo 9) and locked but access road has eroded in several places exposing the underlying geotextile fabric (see Photo 10) and rutted in others (see Photos 11). Access road should be maintained by adding gravel fill and regrading.

5. Riprap at the stabilized outlet structure locate in the uncontaminated section of soil berm at the north end of the Lagoon Area has partially eroded (see Photo12). The river bank should be re-graded and protected by adding properly sized riprap.

The riparian/wetland buffer zone is in relatively good condition. A section of berm along the river collapsed during a recent flood but the area appears to have stabilized and does not require any maintenance. Evidence of recreational visitors was noted throughout the riparian/wetland buffer zone and along the river bank (see Photo 13).

6.5.2 Dean Road Landfill

This landfill was capped in October 2000. Except for routine maintenance issues, the landfill appeared to be in good condition. The entrance was gated and locked. The electrical panel, pole and lines appeared undamaged. No signs of settlement, erosion or slope instability were noted. Except for vegetation growth, perimeter ditches were unobstructed and there was no evidence of sedimentation. The gabion wall was stable and aligned. The cleanouts for the leachate collection system and gas vents showed no evidence of damage. Groundwater monitoring wells were all capped and locked. The leachate collection pad looked undamaged. The following maintenance related issues were identified:

1. The landfill does not appear to have been mowed this year (see Photo 14 and 15). The landfill should be mowed twice a year as stipulated in the O&M Plan.

2. Vegetation is growing through the ditches and riprap in the swale and slopes (see Photos 16 though 18). The swale, ditches and riprap stabilized slopes should be cleared of vegetation to prevent long term displacement of riprap or stones.

3. The perimeter fence is in good condition but is threatened by large vegetation and trees growing next to and even through the fence. Vegetation within three feet on either side of the fence should be cleared.

6.5.3 Former Mill Building Area

This area was found to be in excellent condition. There were no signs of erosion or settlement. The grass is well kept and mowed. The retaining wall appears structurally sound and stable. All of the monitoring wells were intact, capped and locked.

6.5.4 Woods Road Sloped and Riprap Protected Streambank

This area was found to be in excellent condition. There were no signs of erosion. All of the monitoring wells were intact, capped and locked.

6.6 INTERVIEWS

In accordance with the EPA guidance for five-year reviews (EPA, 2001), several personnel involved with the operation and maintenance of the Site were interviewed. Key points of discussion are provided in applicable sections of this report. Attachment 3 provides interview records.

7.0 TECHNICAL ASSESSMENT

This section discusses the technical assessment of the remedy and provides answers to the three questions posed in the EPA guidance for five-year reviews (EPA, 2001).

7.1 QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?

Yes. The remedy is functioning as intended. The review of documents, ARARs, and risk assumptions indicates that the remedy was constructed in accordance with the ROD and ESD and is currently protective. Groundwater monitoring results need to be evaluated at the Dean Road landfill to determine whether there is any the potential migration of contaminated groundwater away from the landfill. An assessment of groundwater exceedances in the Former Mill Area needs to be evaluated to determine whether identified contaminants pose any groundwater risk not currently being addressed by the remedy. Institutional Controls at the Site need to be established and monitored.

7.2 QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES (RAOs) USED AT THE TIME OF REMEDY SELECTION STILL VALID?

No. The toxicity factors have changed since the time of the ROD. However, these changes do not appear to affect the protectiveness of the remedy. The exposure assumptions, cleanup levels and remedial action objectives used at the time of the ROD are still valid.

7.2.1 Review of Human Health Risk Assessments and Toxicity Factors Serving as the Basis for the Remedy

The human health risk assessment report (M&E, 2002) concluded that risks and hazards associated with current trespasser exposures to Lagoon 5 soil and sludge containing chromium exceeded EPA risk management guidelines, as well as future recreational, commercial and/or utility worker exposures to soil and sludge from Lagoons 1, 3 and 5 due to dioxins, polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol, N-nitroso-di-n-propylamine, and the metals arsenic, chromium, lead and mercury. Direct contact with soils in other areas of the Site posed no significant risk to human health. However, the risk assessment determined that there would be significant risk to human health if groundwater from under the capped landfills on the Site containing VOCs, SVOCs, and metals was ingested in the future. Institutional Controls will be established, and continued sampling and analysis of groundwater will be done to ensure the remedy is protective of human health.

Federal drinking water and risk and State drinking water standards have been identified as monitoring standards for groundwater to assess the protectiveness of the landfill caps, and risk-based cleanup levels for soil were established to be protective of future recreational site use outside of the capped landfills. Exceedances of groundwater standards that were identified in the Former Mill/Wood Road area need to be evaluated further and potentially will need to be addressed in a future decision document. Groundwater monitoring results need to be evaluated

at the Dean Road Landfill to determine whether there is any the potential migration of contaminated groundwater away from the landfill.

Direct contact recreational exposures to Hoosic River sediments containing elevated levels of arsenic, dioxins and PCBs also were found to exceed regulatory limits under future use conditions. However, because sediment contaminant concentrations upstream of the Site were greater than those adjacent to the former lagoon area of the Site, their presence was linked to non-site related discharges or background levels. A separate risk calculation assessing only those sediment contaminant concentrations adjacent to the Site indicated risk below EPA risk management guidelines for recreational use. Because the Vermont Department of Health has issued an advisory against consuming fish from the Hoosic River due to the presence of PCBs, the ingestion of recreationally-caught fish was not evaluated in the risk assessment. Upgradient sampling and analysis data of Hoosic River sediments that were collected during the Remedial Investigation indicate elevated levels of PCBs that are attributable to non-site related sources. Though groundwater from the Site is discharging to the Hoosic River, sampling data collected from nearby residential wells upgradient of the site were also evaluated in the risk assessment. Arsenic, manganese and thallium were determined to pose a potential hazard in three of the residential wells tested, but the contamination was determined not to be Site-related.

In 2004, a supplemental risk evaluation (M&E, 2004) was performed as part of the remedial action for lagoon soil/sludge to determine whether excavated and stock-piled lagoon cover and berm soils containing levels of contaminants of concern (COCs) could be used as backfill in the lagoons. During the remedial design, it was anticipated that soils covering the sludge and the surrounding berm soils would be relatively clean material (e.g., contain COC concentrations below cleanup levels), and could be safely used as backfill in the lagoons once lagoon sludge was removed. The supplemental risk assessment focused on potential future adult and young child exposures to soil at the lagoon areas, planned for recreational development. Because the risk associated with future exposure to the cover and berm soils did not exceed EPA's target risk range for recreational use, the decision was made to re-use the cover and berm soils as on-site backfill in the lagoons. Institutional Controls will be established to prevent use of these areas for residential purposes.

In this five-year review report, the toxicity values that served as the basis for the soil cleanup levels, as contained in the ROD, have been re-evaluated to determine whether any changes in toxicity impact the protectiveness of the remedy. Changes in toxicity values since the 2002 and 2004 risk evaluations are also discussed to determine whether reuse decisions remain valid. Any changes in current or potential future exposure pathways or exposure assumptions that may impact remedy protectiveness are also noted. In addition, environmental data, available since the last five year review, have been qualitatively evaluated to determine whether exposure levels existing at the Site present a risk to current human receptors.

7.2.1.1 Changes in Toxicity

Table 7 presents a summary of the changes in toxicity values (oral reference doses and oral cancer slope factors) for compounds selected as Contaminants of Potential Concern (COPCs) as identified in the 2002 risk assessment. Updated toxicity information was obtained from the *Integrated Risk Information System* (IRIS; EPA, 2004) and other current EPA sources (e.g., Superfund Technical Support Center). Toxicity values for contaminants identified as COPCs during the 2004 risk evaluation, performed as part of the remedial actions, have also been listed.

For most contaminants, changes to toxicity information have been minimal. Changes in toxicity values for volatile groundwater COPCs (i.e., 1,2-dichloroethane, 2-methylnaphthalene, chloroform, methyl tert butyl ether, tetrachloroethene, trichloroethene, and xylene) do not affect remedy protectiveness even though the changes represent increases in toxicity because there is no cleanup of groundwater as part of this remedy, there is only monitoring to ensure that contaminated groundwater does not migrate from the areas where waste is being managed in-place. The changes in the atrazine toxicity values are minor and would result in a decrease in the groundwater cleanup level of less than 5 percent. The changes in VOC toxicity values do not affect remedy protectiveness for soils since these compounds were not significant risk contributors prior to the remedy, and the disturbance and removal of soil/sludge likely resulted in diminished levels of VOCs compared to those present prior to remedy implementation. Therefore, the conclusions of the 2002 and 2004 risk evaluations remain valid and the soil cleanup levels, based on the 2002 toxicity values, remain protective.

Benzo(a)pyrene and associated carcinogenic PAHs are site COPCs which have been determined to be carcinogenic through a mutagenic mode of action. In the 2005 Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens, EPA recommends evaluating chemicals with mutagenic modes of action using either chemical-specific data on susceptibility from early-life exposures or age-dependent adjustment factor (ADAF) applied to the cancer slope factor. Because chemical-specific data on susceptibility from early-life exposures are not available for carcinogenic PAHs, ADAFs, which increase the calculated cancer risk for receptors exposed during childhood, are recommended for use. This change affects the soil cleanup levels, calculated for a recreational exposure scenario, as well as the 2004 supplemental risk evaluation. Because the carcinogenic PAHs were only minor soil risk contributors (i.e., total cancer risks of less than 5E-06), the lack of use of ADAFs in calculating the cleanup levels and in the 2004 supplemental risk evaluation does not impact the protectiveness of the remedy.

1,4-Dioxane, a B2 carcinogen, is a compound known to be used as both a solvent and a stabilizer for chlorinated solvents, especially 1,1,1-trichloroethane. The ability to detect low concentrations of 1,4-dioxane has only recently becomes available. Because of its low concentration in groundwater, 1,1,1-trichloroethane was eliminated as a COPC in the 2002 risk assessment. While monitoring data suggests that 1,1,1-trichloroethane is not present at the Site, monitoring data do not include analysis for 1,4-dioxane. Sampling of groundwater for 1,4-dioxane is suggested to determine whether it is present and, if present, whether the levels detected pose an unacceptable risk.

7.2.1.2 Changes in Exposure Pathways/Assumptions

Since the 2002 and 2004 risk evaluations were completed, portions of the Site, including the former tannery building area, have been developed for passive recreational use (soccer fields, seasonal ice skating, picnic areas) and a wastewater treatment facility has been constructed on Lagoon 2. The sludge landfill and Lagoons 3 and 4 have been capped, preventing direct contact exposures to residual contaminated soils and minimizing impacts to groundwater outside of the areas where waste is being managed in-place. Uncapped areas of the Site were remediated to residential standards or a risk assessment was performed to confirm that levels of contamination remaining in exposed soils did not present a risk to current recreational receptors. Groundwater is not currently used for any purpose at the Site. Because current use of the Site is consistent with the exposure assumptions used in the 2002 and 2004 risk evaluations, the remedy is currently protective. Institutional controls are required to be implemented to assure that groundwater in areas were waste is being managed in-place is not used for potable purposes. In addition, future land use at the former lagoon area needs to be limited to those uses consistent with the recreational assumptions employed in the 2004 risk evaluation and institutional controls preventing disturbance of the cap need to be implemented. Because the 2004 risk evaluation only considered future recreational site use for soils, a supplemental evaluation may be necessary should a change be contemplated in site use which would include exposures of greater intensity and frequency than assumed in the risk evaluation. The implementation of comprehensive institutional controls, when complete, will provide long-term protectiveness for all site remedies.

Table 4 presents a summary of maximum concentrations of detected compounds for the former Mill Building/Woods Road monitoring wells. There were low level detections of VOCs at one monitoring well, MW-110R: isopropylbenzene (7.9 ug/L), n-Propylbenzene (6.2 ug/L), tert-Butylbenzene (4.2 ug/L) and sec-Butylbenzene (4.8 ug/L). There were exceedances of metals: antimony, manganese and arsenic above Federal and State drinking water standards. The metals concentrations were consistent in magnitude over time. Data from annual sampling and analysis will be evaluated to identify whether additional information and data are necessary to make a protectiveness determination regarding groundwater in this area.

One pathway of potential concern that was not evaluated in the 2002 risk assessment was the vapor intrusion pathway. This pathway may be of concern at sites where shallow groundwater and soil contaminated with VOCs exists in close proximity to occupied buildings. There are currently no occupied buildings located at the Site, except for the WWTP constructed over Lagoon 2. Because the Lagoon 2 area displayed detectable VOC concentrations in soil when sampled as part of the Remedial Investigation, and in groundwater monitoring wells in the vicinity of the WWTP (MW-L-11 & MW-201), future groundwater data will be screened against appropriate federal and state vapor intrusion guidance and criteria to ensure protection of human health Recommended exposure assumptions and risk assessment methods have not changed significantly since the 2002 and 2004 risk evaluations were completed, except for the method used to evaluate compounds with mutagenic modes of action such as the carcinogenic PAHs. Current methodology calls for the use of age-specific adjustment factors to account for an increased sensitivity during early life. This supplemental early life calculation was not performed as part of the 2002 and 2004 evaluations since the EPA carcinogen risk assessment guidance was published subsequent to the completion of the site-specific risk evaluations.

However, because incremental lifetime cancer risks (ILCRs) were significantly below EPA risk management guidelines for backfilled soils at the former lagoon area and the areas of significant residual contamination are capped with clean cover material, the remedy remains protective as long as the caps are maintained and the Site continues to be used for recreational purposes. Carcinogenic PAHs were also selected as COPCs in Hoosic River sediment. Because PAHs were not identified as significant risk contributors in this medium, the application of an ADAF should not significantly change the risk determined in the Baseline Risk Assessment.

One potential exposure pathway may affect the future protectiveness of the remedy if not properly controlled. The significant flood event that occurred in October 2005 altered a portion of the berm that is located between the Lagoon Area Landfill and the river, but did not damage the landfill or expose waste. Because waste was not exposed by the flood event, the remedy is currently protective of human health. However, there is a small volume of waste beneath a portion of the remaining berm. This area of berm must be maintained to prevent exposures to contaminants in waste that could pose a risk to human health if contacted. EPA's September 28, 2007 Explanation of Significant Differences documents the determination that this limited portion of a protective earthen berm adjacent to the Hoosic River and the new landfill is an integral component of the remedy, and calls for institutional controls to limit future disturbance/excavation in that area to assure the future protectiveness of the remedy.

7.2.1.3 Evaluation of Recent Sampling Data

As discussed in Section 6.4.2, select monitoring wells contaminant concentrations continue to exceed Federal and State drinking water standards, primarily for the metals aluminum, antimony, arsenic, chromium, lead, and manganese. Continued exceedances of groundwater standards indicate that completion of the drinking water ingestion pathway within the former lagoon area would present a risk to residents should anyone consume drinking water within the lagoon area. Institutional controls to prevent the use of contaminated groundwater should be implemented to assure long-term protectiveness. Three monitoring wells upgradient of the Site were sampled and only manganese was detected at two wells at concentrations above State and Federal drinking water standards. These exceedances have been determined not to be from Site contamination. Monitoring data from adjacent private wells upgradient of the Site indicate no exceedances of Federal or State standards.

At the Dean Road Landfill there were exceedences of standards for target list metals (antimony, barium, chromium, manganese, zinc, arsenic and lead) in monitoring wells within the landfill area. Groundwater monitoring results need to be evaluated at the Dean Road Landfill to determine whether there is any the potential migration of contaminated groundwater away from the landfill.

Contaminants in groundwater could potentially discharge to the nearby Hoosic River where direct contact human exposures could occur. Though no surface water samples have been collected from the river, the primary contaminants in groundwater are metals which do not easily cross through the skin and into the body if contacted during recreational use of the river. Surface water contaminant concentrations in samples collected in 2000 indicated a negligible risk to recreational users of the river, assuming incidental ingestion of and dermal contact with surface

water. Because the remedy has been designed to minimize impacts to the river by groundwater discharge and erosion, site-related contaminants in surface water are expected to be less than those measured in 2000 as part of the Remedial Investigation. Therefore, the remedy continues to be protective of human recreational contact with river surface water.

Sediment from the Hoosic River adjacent to the former lagoon area have been sampled and analyzed annually since 2005, as discussed in Section 6.4.3. Table 8 compares the maximum sediment concentrations detected over the last five years to the maximum detected historical sediment concentrations evaluated in the 2002 risk assessment. This comparison can be used to determine whether site-related impacts to the river are diminishing, if upstream non site-related sources are an impact, and if recent sediment concentrations are less than historical sediment concentrations. This allows for a conclusion of a lack of Site-related impact on human health based on recreational sediment exposure.

As identified in the Table 8, current sediment maxima slightly exceed historical maxima for a small number of compounds (2 VOCs, total PCBs, and 3 metals). For each of these compounds, the current maximum detected concentration is less than or approximately equal to a residential soil risk-based concentration, based on a target hazard quotient of 1 or an incremental lifetime cancer risk of 10^{-6}. A comparison to residential soil guidelines is conservative since the frequency and intensity of soil contact in a residential yard is likely to be much greater than contact with sediment in a recreational setting. Based on the magnitude of the decrease in contaminant concentrations compared to those evaluated in the 2002 risk assessment, direct contact recreational exposures to sediment would not be expected to exceed EPA's risk management guidelines. Therefore, the remedy continues to be protective with respect to human sediment exposures.

One final issue to note is that the detection limits for several chemicals in various media are greater than the applicable comparison criteria. For instance, the VGES for antimony is 6.0 ug/L; however the detection limits for antimony in residential well water are generally reported as "< 10 ug/L". In the future, analytical methods with detection limits below applicable standards and screening criteria (e.g., Vapor Intrusion Screening Values corresponding to a 10^{-6} risk level) should be used. This issue is of particular concern for media to which there are exposures, specifically consumption of drinking water from residential wells and the potential inhalation of vapors migrating into inhabited buildings.

7.2.2 Review of Ecological Risk Assessments and Toxicity Factors Serving as the Basis for the Remedy

The ecological risk assessment report (TRC, 2001) concluded that risks associated with ecological receptor exposures to lagoon surface soil containing dioxins, chromium, cadmium and lead exceed levels associated with adverse effects and background risk levels. Risks were predicted to occur to insectivorous and omnivorous birds and mammals primarily from ingestion of contaminants that accumulated within the tissues of terrestrial invertebrates present within the contaminated soils of the lagoons. Hoosic River sediments containing elevated levels of dioxins, PAHs, PCBs and several metals including aluminum, cadmium, chromium, copper, lead and

zinc. The River sediments also exceeded toxicity reference values (TRVs) associated with adverse effects to a variety of aquatic receptors. However, because sediment contaminant concentrations upstream of the Site were similar to those adjacent to the lagoon area of the Site, their presence was linked to non-Site related discharges upstream or background levels.

In this five-year review report, the toxicity values that served as the basis for the soil cleanup levels, as contained in the ROD, have been re-evaluated to determine whether any changes in toxicity impact the protectiveness of the remedy. In addition, environmental data, available since the last five year review, have been qualitatively evaluated to determine whether exposure levels existing at the Site present a risk to current ecological receptors.

7.2.2.1 Changes in Toxicity

Surface soils within the lagoons were evaluated by modeling exposure doses ingested by ecological receptors (meadow vole, woodcock, short-tailed shrew, robin, and deer mouse) to toxicity reference values associated with chronic Lowest Observable Adverse Effect Level (LOAEL). Table 9 presents a summary of the changes in LOAEL toxicity values for compounds selected as Contaminants of Potential Concern (COPCs) as identified in the 2001 ecological risk assessment and which had proposed soil remediation goals identified. Updated toxicity information was obtained from the *Eco-Soil Screening Levels* or Eco-SSLs (EPA, 2005, 2007, 2008) when available.

For most contaminants, changes to avian and mammalian toxicity reference values have been substantially reduced. However, comparing the estimated mean exposure doses ingested by the ecological receptors (as presented in the 2001 ecological risk assessment) indicates that of the compounds for which soil cleanup goals were established, only chromium and lead present risk to the selected ecological receptors. The 2001 ecological risk assessment assumed that all contaminants were 100% bioavailable and did not evaluate the specific bioavailability of ingested contaminants including chromium and lead. Oral absorption fractions since presented in the Eco-SSLs (EPA, 2003) for chromium and lead are 0.5% and 50%, respectively. The very low oral absorption factor of 0.5% for chromium indicates that the lower toxicity reference value for chromium since the 2001 ecological risk assessment was conducted is unlikely to result in an increase in risk associated with this contaminant based on the soil cleanup goal of 733 mg/kg. The lead cleanup goal of 1,000 mg/kg represents a value greater than the maximum concentration previously detected in lagoon surface soils. The change in the lead mammalian toxicity value is unlikely to result in significant changes to risk for the mammalian ecological receptor species when the 50% oral bioavailability factor is considered along with the estimated exposure doses presented in the 2001 ecological risk assessment. The 2009 avian toxicity reference value for lead is expected to be conservative in that the geometric mean of lead avian NOAEL toxicity reference values (10.9 mg/kg-BW/day) is very similar to the 2001 avian toxicity reference value of 11.3 mg/kg-BW/day. Therefore, the overall change in lead toxicity is not expected to significantly alter the resulting risk to terrestrial birds.

7.2.2.2 Changes in Exposure Pathways/Assumptions

Since the 2001 ecological risk evaluation was completed, portions of the Site, including the sludge landfill, Lagoon 3, and portions of Lagoon 4 have been capped, preventing direct contact exposures to residual contaminated soils and minimizing impacts to groundwater. Uncapped areas of the Site were remediated. Because current use of the Site by ecological receptors is believed to be relatively consistent with the exposure assumptions used in the 2001 risk evaluation, the remedy is currently protective for soils at the lagoon area as long as the cap is maintained and Institutional Controls are established.

One pathway of potential concern that was not directly evaluated in the 2001 ecological risk assessment was the transport of contaminants in groundwater to the adjacent Hoosic River. This pathway may be of concern at sites where contaminated groundwater discharges directly to a surface water body. The 2001 ecological risk assessment indirectly evaluated groundwater by assessing concentrations of contaminants detected in surface water samples collected from the Hoosic River. The 2001 ecological risk assessment concluded that surface water impacts to the Hoosic River that are attributable to the Site are not present. Adverse effects to the ecological receptors exposed to the surface water of the Hoosic River under existing conditions are not expected to have changed since the 2001 risk assessment was conducted. This conclusion is based on the observation that concentrations of constituents detected in groundwater samples have not changed significantly since 2001 and/or are similar to concentrations of these constituents detected in upgradient groundwater samples.

7.2.2.3 Evaluation of Recent Sampling Data

Sediment from the Hoosic River adjacent to the former lagoon area has been sampled and analyzed annually since 2005, as discussed in Section 6.4.3. The following table compares the maximum sediment concentrations detected over the last five years to the maximum detected historical sediment concentrations evaluated in the 2001 ecological risk assessment. This comparison can be used to determine whether site-related impacts to the river are diminishing and, if recent sediment concentrations are less than historical sediment concentrations, allows for a conclusion of a lack of site-related impact on environmental health based on sediment exposure by benthic macroinvertebrates.

As identified in Table 10, current maxima slightly exceed historical maxima for a small number of compounds (cis-1,2-dichloroethene, toluene, total PCBs, aluminum, antimony and selenium). For cis-1,2-dichloroethene, total PCBs, aluminum and antimony, the current maximum detected concentration is less than the ecological sediment quality screening benchmark based on risk to benthic macroinvertebrates. The maximum toluene and selenium concentrations exceed a low ecological screening benchmark but are either below the upper screening benchmark (associated with more significant effects to the ecological community) or an upper screening benchmark is not available. Based on the magnitude of the decrease in contaminant concentrations recently detected compared to the concentrations evaluated in the 2001 risk assessment, risk to the benthic macroinvertebrate community from sediment contaminants has been significantly

reduced. Therefore, the remedy continues to be protective with respect to ecological exposure to sediment contaminants.

7.2.3 ARARs Review

Review of Applicable or Relevant and Appropriate Requirements was performed to check the impact on the remedy due to changes in standards that were identified as ARARs in the ROD, newly promulgated standards for contaminants of concern, and TBCs (to be considered) that may affect the protectiveness of the remedy. The tables in Attachment 4 provide an evaluation of ARARs using the regulations and requirement synopses listed in the ROD as a basis. The ARARs evaluation also includes a determination of whether each regulation cited in the ROD is currently ARAR or TBC and whether the requirements have been met. The listed ARARs that remain applicable or relevant and appropriate to the Site have been or are currently being complied with.

Numeric standards that are applicable or relevant and appropriate to the long-term monitoring of residential drinking water wells and Site groundwater monitoring wells, were not identified in the ROD ARARs summary. The general requirement that groundwater monitoring be conducted is an ARAR requirement of the Vermont Solid Waste Regulations were identified as an Action-specific ARAR in the ROD. Tables 3 through 5 of this Five-Year Review identify Federal drinking water and risk-based standards and Vermont drinking water and groundwater standards that are currently being used to assess groundwater monitoring results. These standards may be added to the ARARs for the remedy in a future decision document. Also, federal floodplain management standards identified in the ROD have been removed from the Federal Code of Regulations, so are no longer in effect. Compliance with Executive Order 11988 (Floodplain Management) is a matter addressed under the Protectiveness criterion of the NCP, rather than under the ARARs criterion.

7.3 QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?

Yes. Exceedances of groundwater criteria outside of the Lagoon Area and at the Mill Building/Woods Road area, need to be evaluated and any risks from groundwater that are identified will potentially need to be addressed in a future decision document. In addition, potential migration of contaminated groundwater from the Dean Road Landfill needs to be further assessed. Finally, future groundwater data will be screened against appropriate federal and state vapor intrusion guidance and criteria to ensure protection of human health in the WWTP. There is no additional information that calls into question the protectiveness of the remedy.

7.4 TECHNICAL ASSESSMENT SUMMARY

According to the data reviewed, the Site inspection, and the interviews, the remedy is functioning as intended by the ROD, as modified by the ESD document, except for a potential vapor intrusion pathway at the WWTP (constructed above Lagoon 2) and the groundwater exceedances outside of the areas where waste is being managed in-place.

Because the Lagoon 2 area displayed detectable VOC concentrations in soil when sampled as part of the Remedial Investigation and in groundwater monitoring wells in the vicinity of the WWTP (MW-L-11 & MW-201), future groundwater data will be screened against appropriate federal and state vapor intrusion guidance and criteria to ensure protection of human health. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. The ARARs identified in the ROD remain applicable or relevant and appropriate and either have been met or are being complied with.

The groundwater issues will need to be further evaluated and, if risks from groundwater are identified, further remedial action measures may be addressed in a future decision document.

The implementation of institutional controls to prevent future exposures to waste being managed in-place, to protect the components of the remedy, to prevent residential development, and to prevent groundwater use within the waste management areas will assure the future protectiveness of the remedy.

8.0 ISSUES

Based on the activities conducted during this five-year review, the issues identified in the Table 11 have been noted.

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The issues identified in Section 8 needs to be addressed prior to the next five-year review. Overall, the capped landfill components and the berm underlain with waste are in excellent condition and the issues noted in Table 11 regarding these components can be addressed over time during regularly scheduled maintenance events. Institutional controls for the Lagoon Area are expected to be in place by the year 2011. The remaining groundwater issues will need to be assessed and, if groundwater risks are identified, addressed in a future decision document. Recommendations and follow-up actions to address these issues are summarized in Table 12.

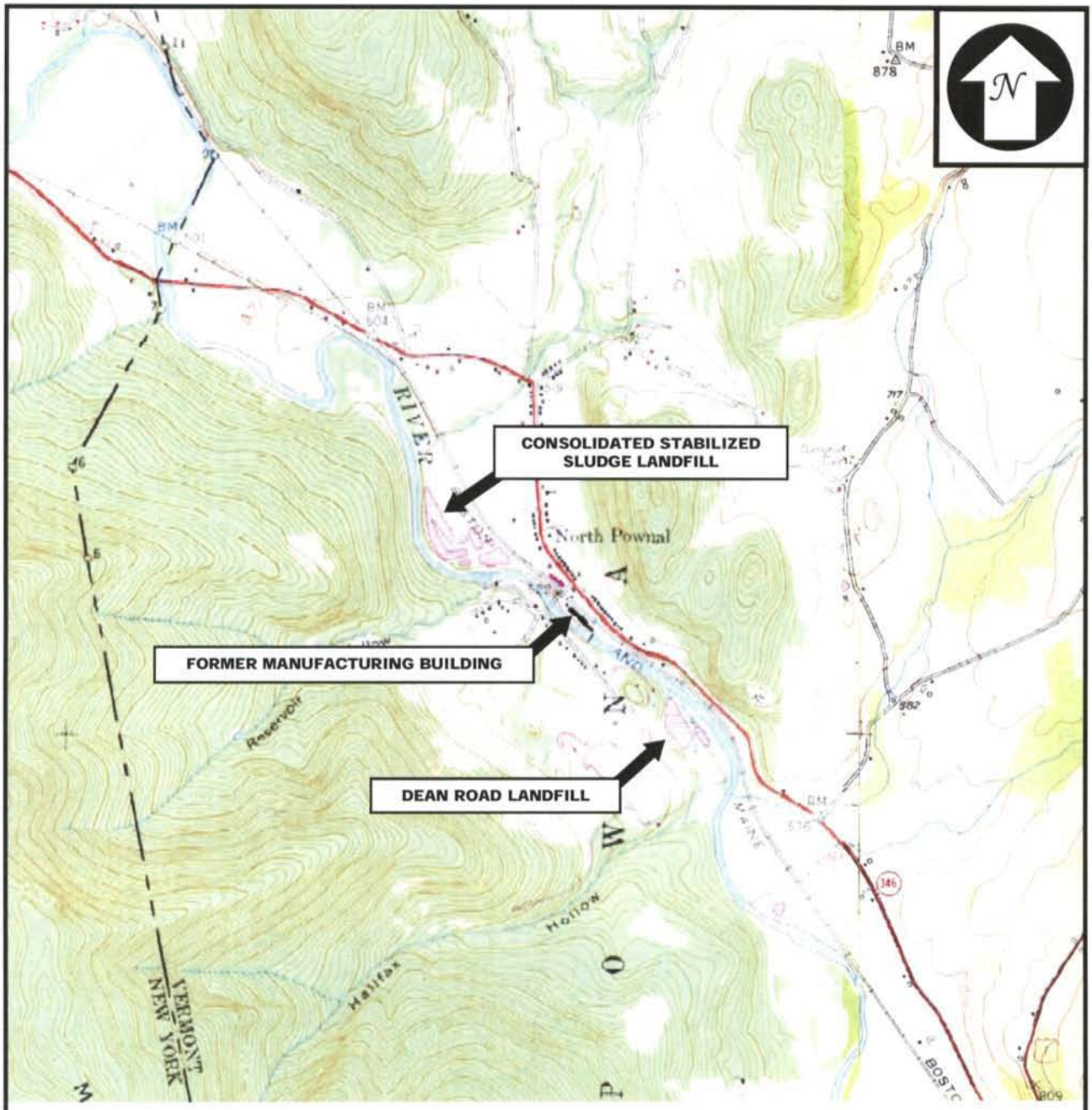
10.0 PROTECTIVENESS STATEMENT

The Lagoon Landfill cap component of the remedy at this Site addressed the principal threat remaining by stabilizing the contaminated sludge and by consolidating the stabilized sludge under an engineered cap. The engineered cap protects current and future use receptors from direct contact with the contaminants of concern and was designed to resist flood events. The Lagoon Landfill remedy is functioning as intended by the ROD, as modified by the ESD document. Because the Lagoon 2 area displayed detectable VOC concentrations in soil when sampled as part of the Remedial Investigation and in groundwater monitoring wells in the vicinity of the WWTP (MW-L-11 and MW-201), future groundwater data will be screened against appropriate federal and state vapor intrusion guidance and criteria to ensure protection of human health. The previous NTCRA established an engineered cap over the Dean Road landfill which protects current and future receptors from direct contact with contaminants of concern within the landfill. Downgradient groundwater monitoring and data evaluation at the Dean Road Landfill is still needed to ensure that contaminated groundwater from the Landfill does not pose a threat to surrounding drinking water. The implementation of institutional controls to prevent future exposures to waste being managed in-place, to prevent residential development, protect components of the remedy, and to prevent groundwater use under the waste management areas will assure the future protectiveness of the remedy. Long-term protectiveness of the remedial action will be verified by continued monitoring of cap integrity, along with monitoring of the surrounding area to ensure compliance with use restrictions. Exceedances of groundwater standards in the Former Mill area and adjacent to the Dean Road Landfill need to be evaluated and, if groundwater risks are identified, potentially addressed in a future decision document.

11.0 NEXT REVIEW

Five-year reviews are done every five years at sites where contaminant levels remain at concentrations that prevent unlimited, unrestricted use of the Site. Since the remedy does not allow for unrestricted use of the Site, a follow-up five-year review will be required. The next five-year review for the Pownal Tannery Site will be conducted in 2014.

FIGURES



BASE MAP IS A PORTION OF THE FOLLOWING 7.5' USGS TOPOGRAPHIC QUADRANGLES: POWNAL, VT, 1954; NORTH POWNAL, VT-NY, 1954, PHOTOREVISED 1980

0 1000 2000 3000

approximate scale in feet

Figure 1

SITE LOCUS

5 YEAR REVIEW
POWNAL TANNERY
POWNAL, VERMONT

Metcalf & Eddy

TRC

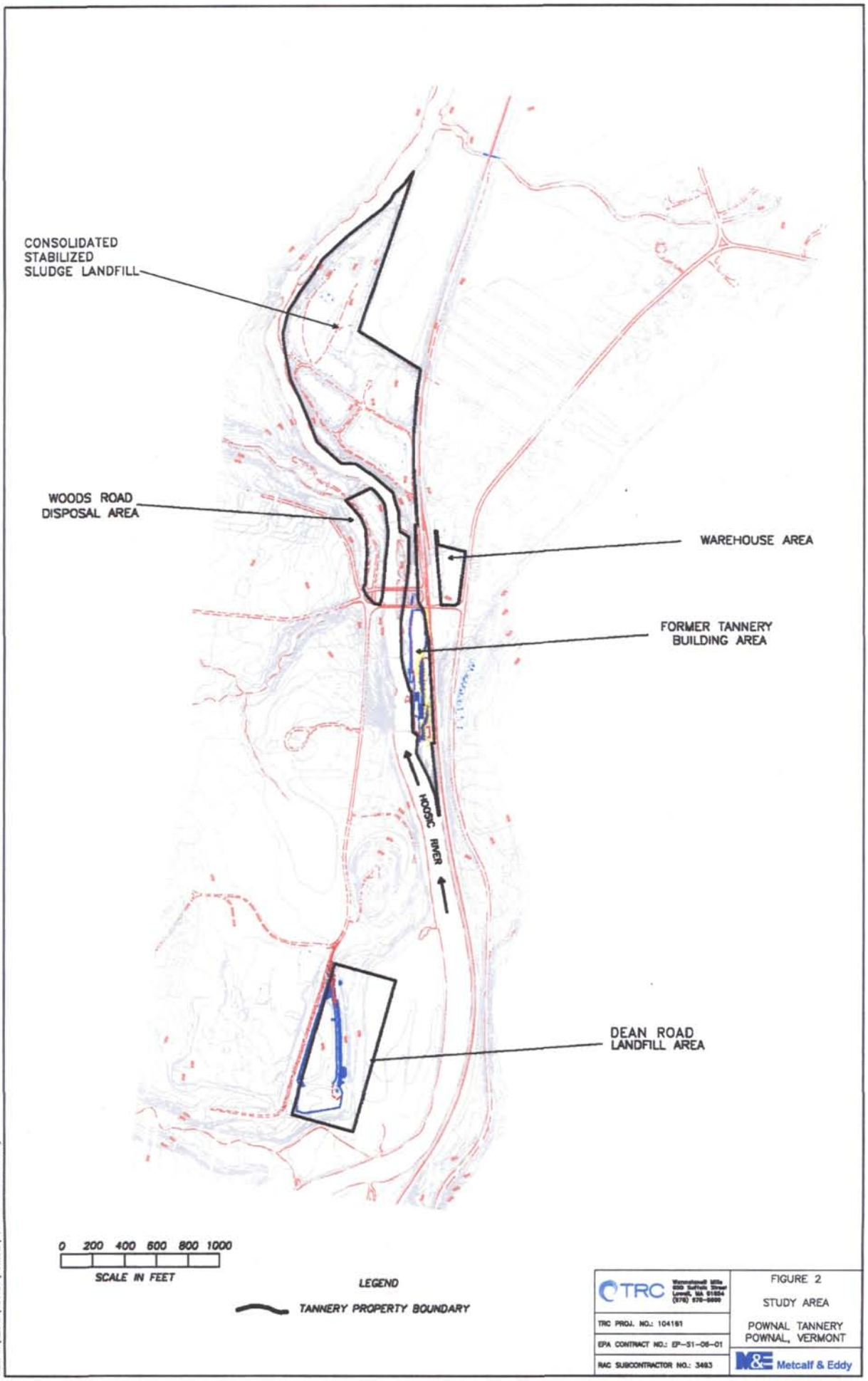
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
978-970-5600

QUADRANGLE LOCATION

VT

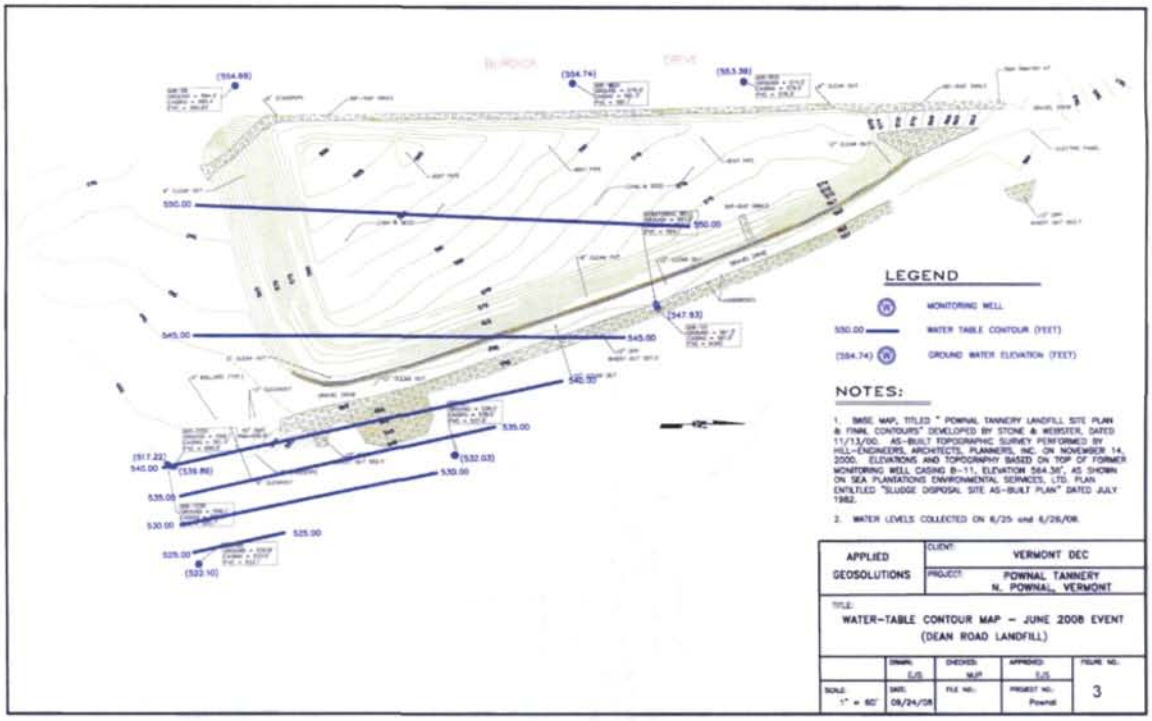
TRC PROJ. NO.:	104161
EPA CONTRACT NO.:	EP-S1-06-01
RAC SUBCONTRACTOR NO.:	3493

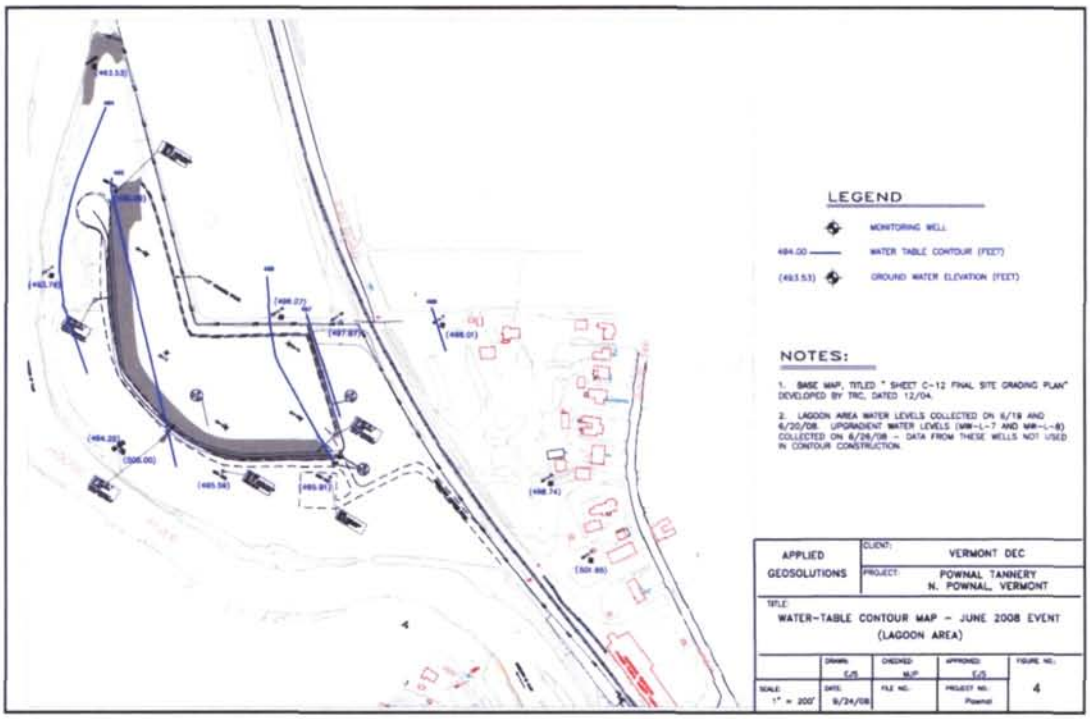
T:\E_CAD\104161\POWNAL\POWNAL SITE LOC.ppt

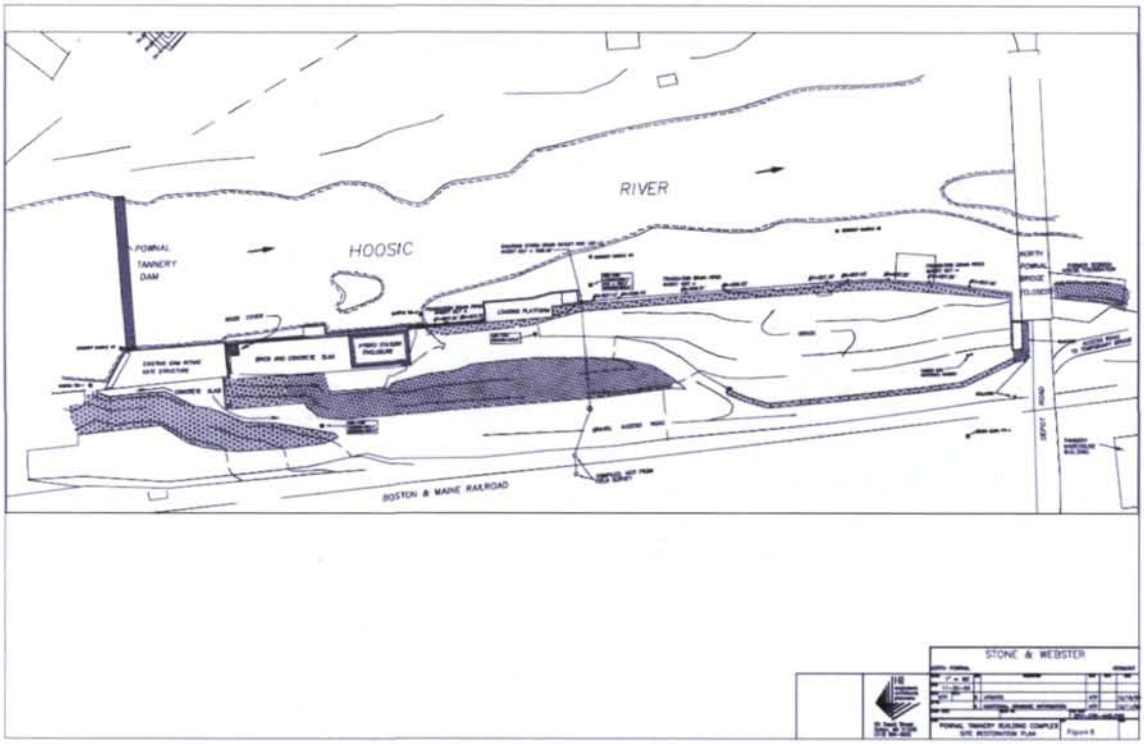


TRC Warrenstreet Mills 650 Suffolk Street Lowell, MA 01854 (978) 970-5600	FIGURE 2
TRC PROJ. NO.: 104181	STUDY AREA
EPA CONTRACT NO.: EP-S1-06-01	POWNAL TANNERY
RAC SUBCONTRACTOR NO.: 3483	POWNAL, VERMONT
	M&E Metcalf & Eddy

FILE: T:\E_DAT\104181\POWNAL\POWNAL STUDY AREA.dwg


LEGEND
MONITORING WELL
550.00 WATER TABLE CONTOUR (FEET)
(554.74) GROUND WATER ELEVATION (FEET)
NOTES:
1. BASE MAP, TITLED " POWNAL TANNERY LANDFILL SITE PLAN & FINAL CONTOURS" DEVELOPED BY STONE & WEBSTER, DATED 11/13/00. AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY HILL-ENGINEERS, ARCHITECTS, PLANNERS, INC. ON NOVEMBER 14, 2000. ELEVATIONS AND TOPOGRAPHY BASED ON TOP OF FORMER MONITORING WELL CASING B-11, ELEVATION 564.36', AS SHOWN ON SEA PLANTATIONS ENVIRONMENTAL SERVICES, LTD. PLAN ENTILTLED "SLUDGE DISPOSAL SITE AS-BUILT PLAN" DATED JULY 1982.
2. WATER LEVELS COLLECTED ON 6/25 and 6/26/08.
APPLIED GEOSOLUTIONS
CLIENT: VERMONT DEC
PROJECT: POWNAL TANNERY N. POWNAL, VERMONT
TITLE: WATER-TABLE CONTOUR MAP - JUNE 2008 EVENT (DEAN ROAD LANDFILL)
DRAWN: EJS
CHECKED: MJP
APPROVED: EJS
FIGURE NO.: 3
SCALE: 1" = 60'
DATE: 08/24/08
FILE NO.:
PROJECT NO.: Pownal


LEGEND
MONITORING WELL
494.00
WATER TABLE CONTOUR (FEET)
(493.53)
GROUND WATER ELEVATION (FEET)
NOTES:
1. BASE MAP, TITLED " SHEET C-12 FINAL SITE GRADING PLAN" DEVELOPED BY TRC, DATED 12/04.
2. LAGOON AREA WATER LEVELS COLLECTED ON 6/19 AND 6/20/08. UPGRADIENT WATER LEVELS (MW-L-7 AND MW-L-8) COLLECTED ON 6/26/08 -- DATA FROM THESE WELLS NOT USED IN CONTOUR CONSTRUCTION.
APPLIED GEOSOLUTIONS
CLIENT: VERMONT DEC
PROJECT: POWNAL TANNERY N. POWNAL, VERMONT
TITLE: WATER-TABLE CONTOUR MAP - JUNE 2008 EVENT (LAGOON AREA)
DRAWN: C/S
CHECKED: MJP
APPROVED: C/S
FIGURE NO.: 4
SCALE: 1" = 200'
DATE: 9/24/08
FILE NO.:
PROJECT NO.: Pownal


RIVER
HOOSIC
POWNAL
TANNERY
DAM
BOSTON & MAINE RAILROAD
STONE & WEBSTER

Tables

TABLE 1. Chronology of Events	
Date	**Event**
December 30, 1981	Pownal Tannery applies for a permit to construct and operate a lined landfill.
January 21, 1982	The Vermont Agency of Natural Resources (VT ANR) determined that the sludge in the lagoons should not be regulated as hazardous waste.
June 09, 1982	A disposal facility certification was issued to permit construction and operation of a lined landfill.
1985	The VT ANR issued a letter to the Pownal Tannery alleging deficiencies and maintenance problems at the site.
1987	Two thirds of the Dean Road Landfill was closed and covered by the Pownal Tanning Company.
April 06, 1988	The Vermont Agency of Environmental Conservation issued an Administrative Order to Pownal Tannery requiring odor control, excavation of sludge from Lagoon 2, preparation of a cleanup plan for Lagoons 4 and 5, further testing of groundwater, and a complete risk assessment.
1993	A time-critical removal action was conducted by EPA to remove and disposed of off-site compressed gas cylinders, asbestos-containing materials, and various containers of hazardous materials.
1995	The hazard Ranking System Package was completed as part of the CERCLA site listing process.
September 29, 1998	The site was proposed for the National Priorities List (NPL).
January 11, 1999	The site was added to the NPL.
August 1999	The Town of Pownal was awarded a Superfund Redevelopment Initiative Grant from EPA to study reuse options for the site after remediation is complete.
1999-2001	EPA conducted a non-time critical removal action (NTCRA) to decontaminate and demolish the tannery buildings, remove contaminated soils along the Hoosic River, and permanently cap the Dean Road landfill.
February 2001	The Town completed the reuse study. The plan included construction of a sewage treatment plant, a skating rink, recreational open areas and nature trails through the Lagoon Area.
September 30, 2002	EPA Record of Decision completed, indicating plans for excavation and capping of Lagoons 1, 3 and 5.
May 2003	Remedial design completed.
September 2003	Phase I construction activities begin
November 30, 2003	Phase I site construction activities completed.
September 30, 2004	Phase II site lagoon area remediation completed.
September 27, 2005	Final Inspection
October 2005	A significant flood event occurred, which altered a portion of the former facility's natural earthen berm. There was no damage to the landfill as a result of the flood.

TABLE 1. Chronology of Events	
Date	**Event**
September 28, 2007	EPA issued an Explanation of Significant Differences which specifies 1) what actions are required to ensure that Institutional Controls are implemented at the site, 2) addresses issues related to the 2005 flood event, 3) identifies a section of berm along the river under which wastes were left in place as included as part of the Site and subject to long-term O&M by the State.
September 2009	EPA completes first Five Year Review

TABLE 2. Soil Recreational Use Cleanup Levels	
Contaminant	**Preliminary Remediation Goal (mg/kg)**
Benzo(a)anthracene	1.7
Benzo(a)pyrene	0.17
Pentachlorophenol	7.7
N-Nitroso-di-n-propylamine	0.27
Arsenic	1.1
Chromium	733
Mercury	23
Lead	1,000
Dioxin TEQ	0.001

TABLE 3 - MAXIMUM DETECTED CONCENTRATIONS IN GROUNDWATER - DEAN ROAD LANDFILL

	Federal		Primary		Secondary		MW-101U		MW-103U	MW-103R		MW-B-8		MW-B-7	MW-102U		MW-B-10		Leachate tank
Units: ug/L	MCL	Health Advisory	VGES	PAL	VGES	PAL	Max.		Max.	Max.		Max.		Max.	Max.		Max.		Max.
None	-	-	-	-	-	-	ND		ND	ND		ND		ND	ND		ND		ND
None	-	-	-	-	-	-	ND		ND	ND		ND		ND	ND		ND		ND
Antimony	6	-	6	3	-	-	**25.3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**28.5**	ND	ND
Barium	2,000	-	2,000	1,000	-	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**306**	ND	**240**
Chromium	100	-	100	50	-	-	**66.5**	ND	ND	ND	ND	ND	ND	ND	**11.2**	ND	**75.2**	ND	ND
Lead	15	-	15	1.5	-	-	**19.6**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**696**	ND	**147**
Manganese	-	300	840	420	50	25	**10,800**	**70.6**	**32.5**	**265**	**177**	**324**	ND	**2,990**	**782**	ND	**82,800**	ND	**1,050**
Zinc	-	-	-	-	5,000	2,500	**97.1**	**51.2**	ND	**26.2**	ND	**33.7**	ND	**90.8**	**120**	ND	**2,430**	ND	**16,700**
Arsenic	10	-	10	1	-	-	**6.56**	ND	ND	**9.71**	**7.8**	ND	ND	ND	**6.1**	ND	**29.3**	ND	ND

Notes:
MCL - Maximum Contaminant Level (according to the Federal Safe Drinking Water Act)
SMCL - Secondary Maximum Contaminant Level (according to National Secondary Drinking Water Regulations)
VGES - Vermont Ground Water Enforcement Standard
PAL - Preventive Action Level
UNF - Unfilter metals sample
FIL - Filtered metals sample
ND - Not Detected above detection limits
Highlighted values indicate exceedance of one of more standards

TABLE 4 - MAXIMUM DETECTED CONCENTRATIONS IN GROUNDWATER - FORMER MILL BUILDING AREA WOODS ROAD

	Federal		Primary		Secondary		OF-1	MW-110U	MW-113R		MW-110R		MW-106U	MW-112U	
Units: ug/L	MCL	Health Advisory	VGES	PAL	VGES	PAL	Max.	Max.	Max.		Max.		Max.	Max.	
Isopropylbenzene	-	-	-	-	-	-	ND	ND	ND		**7.9**		ND	ND	
n-Propylbenzene	-	-	-	-	-	-	ND	ND	ND		**6.2**		ND	ND	
tert-Butylbenzene	-	-	-	-	-	-	ND	ND	ND		**4.2**		ND	ND	
sec-Butylbenzene	-	-	-	-	-	-	ND	ND	ND		**4.8**		ND	ND	
None	-	-	-	-	-	-	ND	ND	ND		ND		ND	ND	
Antimony	6	-	6	3	-	-	ND	ND	ND	ND	**22**	ND	ND	ND	ND
Barium	2,000	-	2,000	1,000	-	-	ND	ND	**232**	**219**	ND	ND	ND	ND	ND
Manganese	-	300	840	420	50	25	ND	**519**	**1,310**	**1,190**	**1,900**	**1,760**	**29.4**	**168**	ND
Zinc	-	-	-	-	5,000	2,500	41.3	ND	ND	ND	**26.8**	ND	ND	ND	ND
Arsenic	10	-	10	1	-	-	ND	ND	**138**	**35**	**11.6**	**10**	ND	ND	ND

Notes:
MCL - Maximum Contaminant Level (according to the Federal Safe Drinking Water Act)
SMCL - Secondary Maximum Contaminant Level (according to National Secondary Drinking Water Regulations)
VGES - Vermont Ground Water Enforcement Standard
PAL - Preventive Action Level
UNF - Unfilter metals sample
FIL - Filtered metals sample
ND - Not Detected above detection limits
Highlighted values indicate exceedance of one of more standards

TABLE 5 - MAXIMUM DETECTED CONCENTRATIONS IN GROUNDWATER - FORMER LAGOON AREA

	Groundwater Quality Standards						UPGRADIENT WELLS						LAGOON AREA WELLS											
	Federal		Primary		Secondary		MW-L-7		MW-L-8		MW-L-9		MW-201		MW-202	MW-203	MW-104U		MW-L-4		MW-107R	MW-107U	MW-L-10		MW-L-11	
Units, ug/L	MCL	Health Advisory	VGES	PAL	VGES	PAL	Max		Max		Max		Max		Max	Max	Max		Max		Max	Max	Max		Max	
Acetone			700	350			ND		ND		ND		ND		ND	ND	ND		ND		ND	ND	ND		12	
Chloromethane			30	15			ND		ND		ND		ND		ND	ND	ND		ND		ND	ND	ND		1,000	
Chlorobenzene	100		100	50			ND		ND		ND		ND		2.5	ND	ND		ND		ND	2.1	ND		ND	
1,3,5-Trimethylbenzene			350	175			ND		ND		ND		2.9		ND	ND	ND		ND		ND	ND	ND		ND	
1,2,4 Trimethylbenzene			350	175			ND		ND		ND		12		ND	ND	ND		ND		ND	ND	ND		ND	
1,2-Dichlorobenzene			600	300			ND		ND		ND		5.3		2.2	ND	ND		ND		ND	ND	ND		ND	
Bis(2-ethylhexyl)phthalate	6		6	3			ND		ND		ND		15		ND	ND	ND		ND		16	ND	ND		ND	
Heptachlor	0 4		NA	NA			ND		ND		ND		ND		ND	ND	ND		ND		ND	ND	0.015		ND	
Total 2,3,7,8-TCDD Equivalence	3 00E-05		3 00E-05	1.10E-05			ND		2.5E-07 B		8.2E-08 BJ		1.40E-06		6.6E-07 JB	2.3E-07 JBA	4.2E-07 J		3.0E-07 JBA		2.9E-07 JB	3.1E-05 JB	1.60E-06		3.3E-07 JB	
Aluminum					200	100	311	ND	21,000	ND	3,330	ND	805	ND	ND	530	322	322	ND	ND	232	ND	233	ND	ND	ND
Calcium							86,400	84,900	90,400	53,000	60,400	54,400	76,100	66,900	77,000	73,400	66,400	59,100	60,000	52,200	342,000	89,900	154,000	77,200	58,200	55,900
Barium	2000		2000	1000			ND	ND	201	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	100		100	50			ND	ND	25.4	ND	ND	ND	16.1	ND	ND	26.2	ND	ND	12.4	ND	ND	ND	ND	ND	ND	ND
Copper	1300						ND	ND	59.6	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron					300	150	459	ND	47,500	628	5,110	257	5,030	742	13,200	1290	3,460	1,320	400	ND	904	2,830	665	ND	363	ND
Lead	15		15	1.5			ND	ND	37.2	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium							20,000	19,600	38,800	13,100	11,300	10,400	10,300	10,100	11,100	13,200	10,900	10,600	13,100	10,900	62,300	12,900	47,000	18,400	11,100	10,400
Manganese		300	840	420	50	25	21.7	ND	1,960	484	266	ND	4,860	4,660	4,800	164	3160	973	104	ND	1,140	5,000	827	638	26.9	ND
Nickel			100	50			ND	ND	48.1	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium							4,610	3,910	4,400	ND	ND	ND	3,900	2,770	3,390	4,630	ND	ND	3,310	ND	ND	3,270	ND	ND	4300	3510
Sodium					250,000	125,000	73,700	73,600	20,500	19,400	16,200	16,100	34,800	34,800	31,300	22,900	21,700	16,200	23,800	19,900	15,000	26,600	61,900	23,700	22,500	18,000
Zinc					5,000	2,500	ND	ND	153	ND	39.2	ND	ND	ND	ND	ND	35.8	20.4	ND	ND	24.8	25.3	ND	ND	ND	ND
Arsenic	10		10	1			ND	ND	21	10	ND	ND	11.7	ND	22.5	ND	6.28	ND	ND	ND	17.7	ND	ND	ND	ND	ND
Mercury	2		2	0.5			NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.215	ND	ND	ND	ND
Cyanide	200		200	100			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	10	ND	ND	ND	ND

Notes.
MCL - Maximum Contaminant Level (according to the Federal Safe Drinking Water Act)
SMCL - Secondary Maximum Contaminant Level (according to National Secondary Drinking Water Regulations)
VGES Vermont Ground Water Enforcement Standard
PAL - Preventive Action Level
UNF - Unfilter metals sample
FIL - Filtered metals sample
NA - Not Analyzed
ND - Not Detected above detection limits
Highlighted values indicate exceedance of one of more standards

TABLE 6 - MAXIMUM CONCENTRATIONS IN SEDIMENT - HOOSIC RIVER

		Sediment Quality Guidelines(1) (SQGs)			SD-30	SD-31	SD-34	SD-36	SD-37
		NEL	LEL	SEL	Max	Max	Max	Max	Max
cis-1,2-Dichloroethene	ug/kg				47	ND	ND	ND	ND
Toluene	ug/kg				ND	410	ND	ND	ND
4-Methylphenol	ug/kg				ND	710	ND	ND	ND
Phenanthrene	ug/kg		560	950,000	ND	ND	ND	450	700
Fluoranthene	ug/kg		750	1,020,000	370	900	520	710	1,000
Pyrene	ug/kg		490	850,000	ND	860	860	650	1,000
Benz(a)anthracene	ug/kg		320	1,480,000	ND	ND	ND	ND	550
Chrysene	ug/kg		340	460,000	ND	ND	ND	ND	570
Benzo(a)pyrene	ug/kg		370	1,440,000	ND	ND	ND	ND	480
Benzo(b)fluoranthene	ug/kg				ND	ND	ND	ND	440
Dieldrin	ug/kg	0.6	2	19,000	ND	ND	ND	2.2	ND
4,4' DDT (total)	ug/kg		7	6,000	ND	ND	5.9	2.6	2.8
gamma-Chlordane	ug/kg	5	3	1,000	ND	10	ND	ND	ND
Pentachlorobiphenyl	ug/kg				ND	26	ND	ND	ND
Tetrachlorobiphenyl	ug/kg				ND	21	ND	ND	ND
	mg/kg		10,000	100,000					
Total 2,3,7,8-TCDD Equivalence	ng/kg				1 JAI	2.9 JAI	12 JA	0.49 JAI	0.79 JAI
Aluminum	mg/kg				8,650	14,200	10,200	9,390	11,900
Antimony	mg/kg				9.12	15.2	12.0	18.2	38.4
Arsenic	mg/kg		6	33	3.91	5.35	4.38	2.65	4.96
Barium	mg/kg				33.3	89.2	50.8	ND	71.2
Beryllium	mg/kg				ND	ND	ND	ND	0.538
Cadmium	mg/kg		0.6	10	ND	1.39	ND	ND	ND
Calcium	mg/kg				21,300	14,900	8,840	9,570	12,300
Chromium	mg/kg		26	110	20.6	29.6	37.3	19.8	61.3
Cobalt	mg/kg				ND	ND	8.27	7.53	10.9
Copper	mg/kg		16	110	13.7	48.1	22.5	17.1	33
Iron	mg/kg		20,000	40,000	22,700	28,000	25,800	21,700	25,500
Lead	mg/kg		31	250	15.4	50	30	18	46
Magnesium	mg/kg				13,400	9,890	7,680	6,070	9,470
Manganese	mg/kg		460	1,100	264	1,010	529	417	787
Nickel	mg/kg		16	75	20.3	28	17.6	16.8	20
Potassium	mg/kg				722	1,820	1,280	761	1,460
Selenium	mg/kg				ND	ND	ND	ND	16.1
Silver	mg/kg				ND	ND	ND	ND	ND
Sodium	mg/kg				ND	ND	ND	ND	ND
Thallium	mg/kg				ND	ND	ND	ND	ND
Vanadium	mg/kg				10.6	ND	12.7	11	14.3
Zinc	mg/kg		120	820	101	162	102	77	138
Mercury	mg/kg				0.0784	0.182	0.142	0.114	0.156
Cyanide	mg/kg				ND	ND	ND	ND	ND

Notes:

J - Concentration detected is below the calibration range

A - Detection limit based on signal-to-noise measurement

I - Interference

Highlighted values indicate exceedance of one of more standards

(1) Guidelines for the Protection of Aquatic Sediment Quality in Ontario (1993)

NEL= No Effects Level

LEL= Lowest Effects Level

SEL= Severe Effects Levels

TABLE 7.
Comparison of 2002/2004 and 2009 Oral Reference Doses and Oral Cancer Slope Factors for Soil Compounds of Potential Concern

Contaminant of Potential Concern	Oral Reference Dose (RfD) (mg/kg-day)			Oral Slope Factor (SF) $(mg/kg\text{-}day)^{-1}$		
	2002	2004[(b)]	2009	2002	2004[(b)]	2009
1,2-Dichlorobenzene	0.09		0.09	N/A		N/A
1,2-Dichloroethane	0.03		0.02	0.091		0.091
1,3-Dichlorobenzene	0.0009		N/A	N/A		N/A
1,4-Dichlorobenzene	0.03		0.07	0.024		0.0054
Benzene	0.003		0.004	0.055		0.055
Bromodichloromethane	0.02		0.02	0.062		0.062
Carbon tetrachloride	0.0007		0.0007	0.13		0.13
Chlorobenzene	0.02		0.02	N/A		N/A
Chloroform	0.01		0.01	0.0061		0.031
Methyl tert butyl ether	N/A		N/A	N/A		0.0018
Methylene chloride	0.06		0.06	0.0075		0.0075
Tetrachloroethene	0.01		0.01	0.052		0.54
Trichloroethene	0.006		N/A	0.011		0.013
Xylene (total)	2		0.2	N/A		N/A
2-Methylnaphthalene	0.02		0.004	N/A		N/A
4-Methylphenol	0.005		0.005	N/A		N/A
Acetophenone	0.1		0.1	N/A		N/A
Atrazine	0.04		0.035	0.22		0.23
Benzo(a)anthracene	N/A	N/A	N/A	0.73	0.73	0.73
Benzo(a)pyrene	N/A	N/A	N/A	7.3	7.3	7.3
Benzo(b)fluoranthene	N/A	N/A	N/A	0.73	0.73	0.73
Benzo(k)fluoranthene	N/A		N/A	0.073		0.073
Bis(2-chloroethoxy)methane	N/A		0.003	N/A		N/A
Bis(2-chloroethyl)ether	N.A		N/A	1.1		1.1
Bis(2-ethylhexyl)phthalate	0.02		0.02	0.014		0.014
Dibenz(a,h)anthracene	N/A	N/A	N/A	7.3	7.3	7.3
Indeno(1,2,3-cd)pyrene	N/A		N/A	0.73		0.73
N-Nitroso-di-n-propylamine	N/A		N/A	7		7
Naphthalene	0.02		0.02	N/A		N/A
Nitrobenzene	0.0005		0.002	N/A		N/A
Pentachlorophenol	0.03		0.03	0.12		0.12
Phenanthrene	0.02		0.02	N/A		N/A

TABLE 7.
Comparison of 2002/2004 and 2009 Oral Reference Doses and Oral Cancer Slope Factors for Soil Compounds of Potential Concern

Contaminant of Potential Concern	Oral Reference Dose (RfD) (mg/kg-day)			Oral Slope Factor (SF) $(mg/kg\text{-}day)^{-1}$		
	2002	2004[b]	2009	2002	2004[b]	2009
4,4'-DDE	N/A		N/A	0.34		0.34
Aldrin	0.00003		0.00003	17		17
Alpha-BHC	N/A		0.008	6.3		6.3
Total PCBs	0.00002		0.00002	2		2
Beta-BHC	N/A		N/A	1.8		1.8
Delta-BHC	N/A		N/A	N/A		N/A
Dieldrin	0.00005		0.00005	16		16
Heptachlor	0.0005		0.0005	4.5		4.5
Heptachlor epoxide	0.00001		0.000013	9.1		9.1
Dioxin TEQ	N/A	N/A	1E-09	1.5E+05	1.5E+05	1.3E+05
Antimony	0.0004		0.0004	N/A		N/A
Arsenic	0.0003	0.0003	0.0003	1.5	1.5	1.5
Barium	0.07		0.2	N/A		N/A
Cadmium (food)	0.001	0.001	0.001	N/A	N/A	N/A
Chromium III	2		1.5	N/A		N/A
Chromium VI	0.003		0.003	N/A		N/A
Cyanide	0.02		0.02	N/A		N/A
Lead [a]	N/A		N/A	N/A		N/A
Manganese (soil)	0.07	0.07	0.07	N/A	N/A	N/A
Manganese (water)	0.02		0.02	N/A		N/A
Mercury (inorganic)	0.0003		0.0003	N/A		N/A
Mercury (organic)	0.0001	0.0001	0.0001	N/A	N/A	N/A
Thallium	0.00008		0.000065	N/A		N/A
Vanadium	0.009		0.005	N/A		N/A

N/A = Not Applicable or Not Available
(a) Lead is evaluated through the use of exposure modeling for adults and children.
(b) 2004 evaluation only looked at the analytes noted.

TABLE 8.
Comparison of Maximum Detected Sediment Concentrations (2005 to 2008) to Historical Maximum Detected Sediment Concentrations

Contaminants	Maximum Concentration - 2005 to 2008 (mg/kg)	Historical Maximum Concentration - 2002[(a)] (mg/kg)
cis-1,2-Dichloroethene	***0.047***	<0.006
Toluene	***0.41***	0.34
4-Methylphenol	0.71	1.2
Phenanthrene	0.70	10
Fluoranthene	1	8.5
Pyrene	1	14
Benzo(a)anthracene	0.55	5.4
Chrysene	0.57	5.3
Benzo(a)pyrene	0.48	6.5
Benzo(b)fluoranthene	0.44	3.8
Dieldrin	0.0022	0.0049
4,4'-DDT	0.0059	0.007
Gamma-Chlordane	0.001	0.005
Total PCBs	***0.047***	0.041
Dioxin TEQ	0.000012	0.000073
Aluminum	***14,200***	14,000
Antimony	***38.4***	1.2
Arsenic	5.35	14.2
Barium	89.2	109
Beryllium	0.538	0.61
Cadmium	1.39	3.2
Chromium	37.3	106
Cobalt	10.9	18.1
Copper	48.1	174
Iron	28,000	40,900
Lead	50	94.9
Manganese	1,000	2,790
Nickel	28	31.1
Selenium	***16***	2.3
Vanadium	14.3	16.5
Zinc	162	197
Mercury	0.182	2.3

Compounds in ***bold italics*** exceed their respective risk-based concentrations
(a) Maximum concentrations presented on Table 2.18 of the 2002 human health risk assessment

TABLE 9.
Comparison of 2001 and 2009 Toxicity Reference Values (Lowest Observable Adverse Effect Levels) for Compounds of Potential Concern with Soil Cleanup Goals

Contaminant of Potential Concern	Toxicity Reference Values			
	Avian LOAEL (mg/kg-BW/day)		Mammalian LOAEL (mg/kg-BW/day)	
	2001	2009	2001	2009
Benzo(a)anthracene	NA	NA	10	3.1
Benzo(a)pyrene	NA	NA	10	3.1
Pentachlorophenol	88	22.5	13	9.5
N-Nitroso-di-n-propylamine	N/A	N/A	N/A	N/A
Arsenic	7.4	3.6	9.3	1.7
Chromium	5	2.8	N/A	N/A
Mercury	0.9	N/C	N/A	N/A
Lead	11.3	1.9	80	5.0
Dioxin TEQ	0.00014	N/C	0.00001	N/C

N/A = Not Available N/C = No Change from 2001

TABLE 10.
Comparison of Maximum Detected Sediment Concentrations (2005 to 2008) to Historical Maximum Detected Sediment Concentrations and Sediment Quality Guidelines

Contaminants	Sediment Quality Guideline[a]		Maximum Concentration – 2005 to 2008 (mg/kg)	Historical Maximum Concentration - 2002[b] (mg/kg)
	LEL/Chronic TRV (mg/kg)	SEL/Acute TRV (mg/kg)		
cis-1,2-Dichloroethene	0.400	-	0.047	<0.006
Toluene	0.05	0.60	*0.41*	*0.34*
4-Methylphenol	0.67	-	*0.71*	*1.2*
Phenanthrene	0.56	9.5	*0.70*	***10***
Fluoranthene	0.75	10.2	*1*	*8.5*
Pyrene	0.49	8.5	*1*	***14***
Benzo(a)anthracene	0.32	14.8	*0.55*	*5.4*
Chrysene	0.34	4.6	*0.57*	***5.3***
Benzo(a)pyrene	0.37	14.4	*0.48*	*6.5*
Benzo(b)fluoranthene	-	-	0.44	3.8
Dieldrin	0.052	0.91	0.0022	0.0049
4,4'-DDT	0.008	0.12	0.0059	0.007
Gamma-Chlordane	0.0045	0.06	0.001	*0.005*
Total PCBs	0.07	5.3	0.047	0.041
Dioxin TEQ	-	-	0.000012	0.000073
Aluminum	14,000	-	*14,200*	14,000
Antimony	64	-	38.4	1.2
Arsenic	5.9	17	5.35	*14.2*
Barium	20	-	*89.2*	*109*
Beryllium	-	-	0.538	0.61
Cadmium	0.6	3.5	*1.39*	*3.2*
Chromium	37.3	90	*37.3*	***106***
Cobalt	-		10.9	18.1
Copper	35.7	197	*48.1*	*174*
Iron	20,000	40,000	*28,000*	***40,900***
Lead	35	91	*50*	***94.9***
Manganese	460	1,100	*1,000*	***2,790***
Nickel	18	35.9	*28*	*31.1*
Selenium	0.1	-	*16*	*2.3*
Vanadium	-	-	14.3	16.5
Zinc	123	315	*162*	*197*
Mercury	0.174	0.486	*0.182*	***2.3***

Compounds in *italics* exceed their respective LEL/chronic TRV risk-based concentration.
Compounds in ***bold italics*** exceed their respective SEL/acute TRV risk-based concentration.
LEL = Lowest Effect Level. SEL = Severe Effect Level.
(a) See Table 12 of the 2001 ecological risk assessment.
(b) Maximum concentrations presented on Tables I-6 thru I-9 of the 2001 ecological risk assessment

TABLE 11. Issues		
Issues	**Affects Current Protectiveness (Y/N)**	**Affects Future Protectiveness (Y/N)**
Lagoon Area		
Due to low levels of VOCs detected in soil and groundwater in this area, future groundwater data will be screened against appropriate federal and state vapor intrusion guidance and criteria.	N	N
Institutional controls have not yet been implemented to prevent future exposures to wastes being managed in place, to prevent residential use, to protect components of the remedy, and to prevent groundwater use within the lagoon area.	N	Y
Dean Road Landfill		
Institutional controls have not yet been implemented to prevent future exposures to capped waste, to prevent residential use, to protect components of the remedy, and to prevent groundwater use within the waste management unit.	N	Y
An assessment is needed to determine whether contaminated groundwater is migrating from the landfill	N	Y
Groundwater		
Exceedances of GW standards in the Former Mill area need to be assessed and if a groundwater risk is identified, a groundwater remedial action would be required to be established in a future decision document	N	Y

Table 12: Recommendations and Follow-up Actions						
Issue	**Recommendations and Follow-up Actions**	**Party Responsible**	**Oversight Agency**	**Milestone Date**	**Affects Protectiveness**	
					Current	**Future**
Lagoon Area						
Potential for a vapor intrusion pathway at the WWTP	Conduct a screening of future groundwater data against appropriate federal and state vapor intrusion guidance and criteria	EPA	VTDEC/ EPA	September 2010	N	N
Institutional controls are not complete.	Complete the implementation of comprehensive institutional controls.	EPA	VTDEC/ EPA	September 2011	N	Y
Dean Road Landfill						
Institutional controls are not complete.	Complete the implementation of comprehensive institutional controls.	EPA	VTDEC/ EPA	September 2012	N	Y
Groundwater in MWs at edge of the landfill exceed standards	Evaluate annual monitoring data and potential risks to determine need for additional monitoring wells and remedial action measures.	EPA	VTDEC/ EPA	September 2012	N	Y
Groundwater						
Groundwater exceeds standards in Former Mill Area	Evaluate risk in this area and need for additional remedial action measures.	EPA	VTDEC/ EPA	September 2013	N	Y

LIST OF DOCUMENTS REVIEWED

Metcalf & Eddy, Inc. (M&E). 2005. *Lagoon Area Remediation Remedial Action Completion Report, Pownal Tannery Site, Pownal, Vermont.* Prepared for the U.S. Environmental Protection Agency. February 2005.

U.S. Environmental Protection Agency (USEPA). 2002. *Record of Decision, Pownal Tannery Superfund Site, Pownal, Vermont.* September 9, 2002.

U.S. Environmental Protection Agency (USEPA). 2005. *Site Reuse Profile. Pownal Tannery Superfund Site, Pownal, Vermont.* August 2005.

U.S. Environmental Protection Agency (USEPA). 2005. *Remedial Action Report. Pownal Tannery Superfund Site, Pownal, Vermont.* September 2005.

U.S. Environmental Protection Agency (USEPA). 2007. *Explanation of Significant Differences, Pownal Tannery Superfund Site, Pownal, Vermont.* September 28, 2007.

Vermont Department of Environmental Conservation (VTDEC). 2004. *Annual Operation and Maintenance Report. Pownal Tannery Superfund Site, Pownal, Vermont.* January 4, 2004.

Vermont Department of Environmental Conservation (VTDEC). 2005. *Annual Operation and Maintenance Report. Pownal Tannery Superfund Site, Pownal, Vermont.* January, 2005.

Vermont Department of Environmental Conservation (VTDEC). 2005. *Health and Safety Plan – Landscape Maintenance Activities. Pownal Tannery Superfund Site, Pownal, Vermont.* July 2005.

Vermont Department of Environmental Conservation (VTDEC). 2006. *Operations and Maintenance Plan. Pownal Tannery Superfund Site, Pownal, Vermont.* April 2006.

Vermont Department of Environmental Conservation (VTDEC). 2006. *Annual Operation and Maintenance Report. Pownal Tannery Superfund Site, Pownal, Vermont.* April 25, 2007.

Vermont Department of Environmental Conservation (VTDEC). 2007. *Annual Operation and Maintenance Report. Pownal Tannery Superfund Site, Pownal, Vermont.* April 11, 2008.

Vermont Department of Environmental Conservation (VTDEC). 2008. *Annual Operation and Maintenance Report. Pownal Tannery Superfund Site, Pownal, Vermont.* March 16, 2009.

Attachment 2
Site Inspection Checklist and Photographs

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Pownal Tannery Superfund Site	**Date of inspection:** June 9, 2009
Location and Region: Pownal, VT/Region I	**EPA ID:** VTD069910354
Agency, office, or company leading the five-year review: USEPA, Region I	**Weather/temperature:** Overcast, 70s

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- Groundwater pump and treatment
- Surface water collection and treatment
- Other _____

- Monitored natural attenuation
- Groundwater containment
- Vertical barrier walls

Attachments: Inspection team roster attached Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Brian Woods VTDEC Project Manager July 7, 2009
   Name Title Date
   Interviewed ☐ at site ☐ at office ☒ by phone Phone no. _____
   Problems, suggestions; ☒ Report attached See interview record

2. **O&M staff** None
   Name Title Date
   Interviewed ☒ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; Not applicable

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency Town Selectboard
Contact Nelson Brownell Chairman July 10, 2009 (518) 698-4640
Name Title Date Phone no.
Problems; suggestions; ☒ Report attached

Agency
Contact
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached

Agency
Contact
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached

Agency
Contact
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached

4. **Other interviews** (optional) ☒ Report attached.

Linda Scirappa Town of Pownal

Leslie McVickar US EPA

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☒ O&M manual — ☒ Readily available — ☒ Up to date — ☐ N/A
   - ☒ As-built drawings — ☒ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Maintenance logs — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — ☒ Readily available — ☒ Up to date — ☐ N/A
   - ☐ Contingency plan/emergency response plan — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

3. **O&M and OSHA Training Records** — ☒ Readily available — ☒ Up to date — ☐ N/A

   Remarks_____

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Other permits_____ — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

5. **Gas Generation Records** — ☒ Readily available — ☐ Up to date — G N/A

   Remarks_____

6. **Settlement Monument Records** — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks_____

7. **Groundwater Monitoring Records** — ☒ Readily available — ☒ Up to date — ☐ N/A

   Remarks_____

8. **Leachate Extraction Records** — ☒ Readily available — ☐ Up to date — GN/A

   Remarks_____

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — ☒ N/A
   - ☐ Water (effluent) — ☐ Readily available — ☐ Up to date — ☒ N/A

   Remarks_____

10. **Daily Access/Security Logs** — ☐ Readily available — ☐ Up to date — ☒ N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

☒ State in-house ☒ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate_____~125,000_____ ☐ Breakdown attached

Total annual cost by year for review period if available

From__2003_____ To__2008__ _____~$25,000/yr____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

From_____ To_____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____None_____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A

Remarks__Signs are posted and the perimeter access road is gated. Dean Road Landfill is secured by a perimeter fence._____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented * ☒ Yes ☐ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) _____
Frequency _____
Responsible party/agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No ☐ N/A
Other problems or suggestions: ☐ Report attached

_____
__* ICs have not yet been implemented. _____

2. **Adequacy** ☐ ICs are adequate ☐ ICs are inadequate ☒ N/A
Remarks: ICs have not yet been implemented.

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks _____

2. **Land use changes on site** ☒ N/A
Remarks _____

3. **Land use changes off site** ☒ N/A
Remarks _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks _____

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent_~ 0.5' dia _____ Depth___UNK_____
   Remarks_Two animal burrows were found along the edge of the landfill crest; one just above Culvert 2 and the other at the mid-point between GV-4 and GV-5. See photographs in report._____

5. **Vegetative Cover** ☐ Grass ☒ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks_Riprap slope is in good condition_____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
- ☐ Wet areas ☐ Location shown on site map Areal extent_____
- ☐ Ponding ☐ Location shown on site map Areal extent_____
- ☐ Seeps ☐ Location shown on site map Areal extent_____
- ☐ Soft subgrade ☐ Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
Areal extent_____
Remarks_____

B. Benches ☐ Applicable ☒ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☒ N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☒ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☒ N/A or okay
Remarks_____

C. Letdown Channels ☐ Applicable ☒ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☒ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☒ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☒ No evidence of erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☒ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☒ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☒ Applicable G N/A

1. **Gas Vents** ☐ Active ☒ Passive
☐ Properly secured/locked ☒ Functioning ☐ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks_____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks_____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☒ N/A
Remarks_____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☒ N/A
   Remarks_____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks_____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks_____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Areal extent_____ Depth_____ ☒ N/A
   ☐ Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____

3. **Outlet Works** ☐ Functioning ☒ N/A
   Remarks_____

4. **Dam** ☐ Functioning ☒ N/A
   Remarks_____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable G N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
   ☒ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ☒ Functioning ☐ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   ☐ Performance not monitored
   Frequency_____ ☐ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES G Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines GApplicable ☒ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
G Good condition G All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks:

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
G Good condition☐ Needs Maintenance
Remarks:

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks:

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

C. Treatment System G Applicable ■ N/A

1. **Treatment Train** (Check components that apply)
   G Metals removal G Oil/water separation ☐ Bioremediation
   ☐ Air stripping G Carbon adsorbers
   GFilters_____
   G Additive (*e.g.*, chelation agent, flocculent):
   G Others:
   ☐ Good condition ☐ Needs Maintenance *
   GSampling ports properly marked and functional
   ☐ Sampling/maintenance log displayed and up to date
   G Equipment properly identified
   ☐ Quantity of groundwater treated annually_____
   ☐ Quantity of surface water treated annually_____
   Remarks

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A G Good condition☐ Needs Maintenance
   Remarks_____
   _____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☐ Good condition* GProper secondary containment G Needs Maintenance
   Remarks:

4. **Discharge Structure and Appurtenances**
   ☐ N/A G Good condition☐ Needs Maintenance
   Remarks_____
   _____

5. **Treatment Building(s)**
   ☐ N/A G Good condition (esp. roof and doorways) ☐ Needs repair
   G Chemicals and equipment properly stored
   Remarks_____
   _____

6. **Monitoring Wells** (pump and treatment remedy)
   G Properly secured/locked G Functioning G Routinely sampled ☐ Good condition
   ☐ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks:

D. Monitoring Data

1. Monitoring Data
   G Is routinely submitted on time G Is of acceptable quality

2. Monitoring data suggests:
   G Groundwater plume is effectively contained G Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks MNA is not being done

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).
The remedy is effective in stabilizing and isolating the contaminated sludge.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
The current and long-term protectiveness of the remedy will be ensured with the implementation of institutional controls.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None at this time.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. The VTDEC has scaled back the monitoring requirements for groundwater.

AECOM

POWNAL SUPERFUND SITE

LAGOON AREA REMEDIATION LANDFILL

PHOTOS FROM JUNE 9, 2009 SITE VISIT

Photo 1 No signs of instability or erosion on side slopes. Landfill side slopes need mowing.

Photo 2 No signs of settlement or localized depressions. Landfill crest needs mowing. Gas vents remain undamaged and functional.

Photo 3 Vegetation growing on riprap should be removed. Culverts are unobstructed.

Photo 4 Vegetation growing on riprap should be removed. Culverts are unobstructed.

Photo 5 Lateral ditches are clear except for vegetation. Perimeter fence is in good condition.

Photo 6 Groundwater monitoring wells are capped and locked.

Photo 7 Animal burrow at edge of riprap above Culvert No. 2

Photo 8 Animal borrow at edge of land fill crest at mid-point between GV-4 and GV-5.

Photo 9 Land fill entrance is gated and locked.

Photo 10 Gravel road requires maintenance. Perimeter fence is in good condition.

Photo 11 Rutted access road to stabilized outlet structure requires maintenance.

Photo 12 Bank erosion and loss of riprap has occurred at stabilized outlet structure.

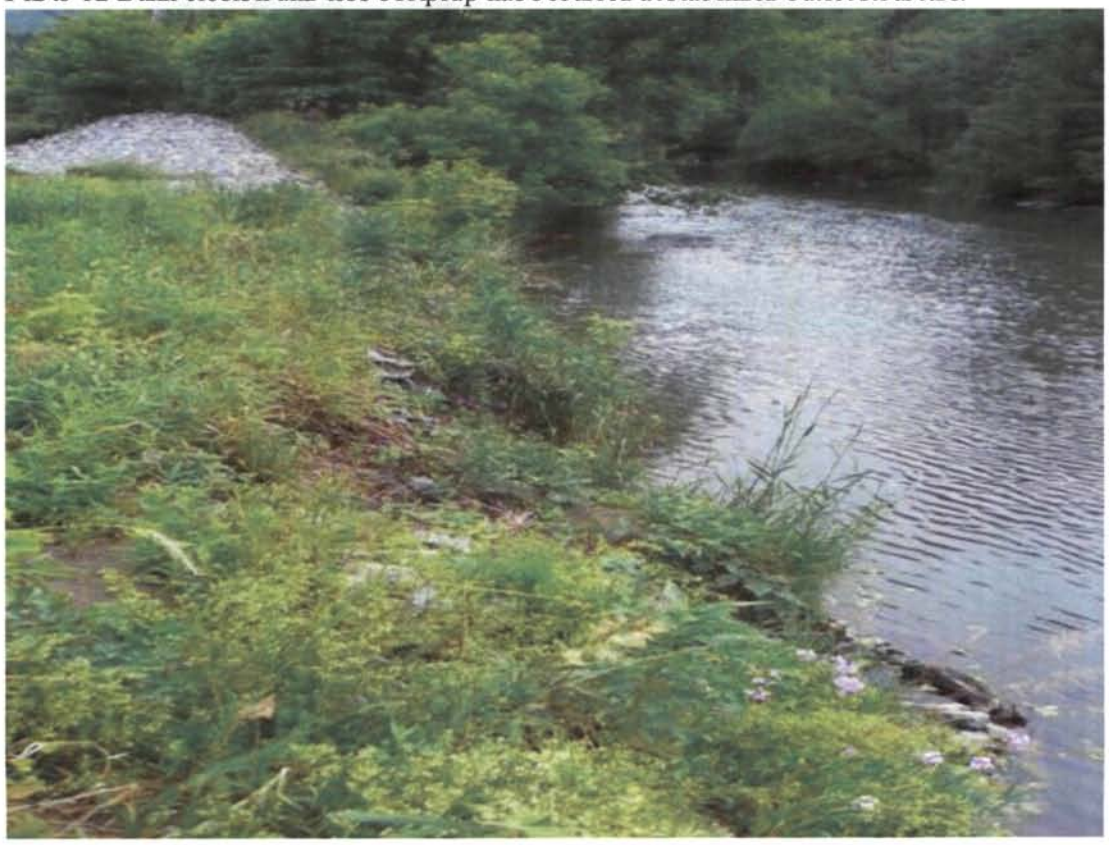


Photo 13 Evidence of recreational visitors.

POWNAL SUPERFUND SITE

DEAN ROAD LANDFILL

PHOTOS FROM JUNE 9, 2009 SITE VISIT

Photo 14 Locked gate and electrical panel are in good condition. Landfill vegetation is too tall.

Photo 15 Landfill should be mowed at least twice a year.

Photo 16 Ditches should be cleared of all vegetation.

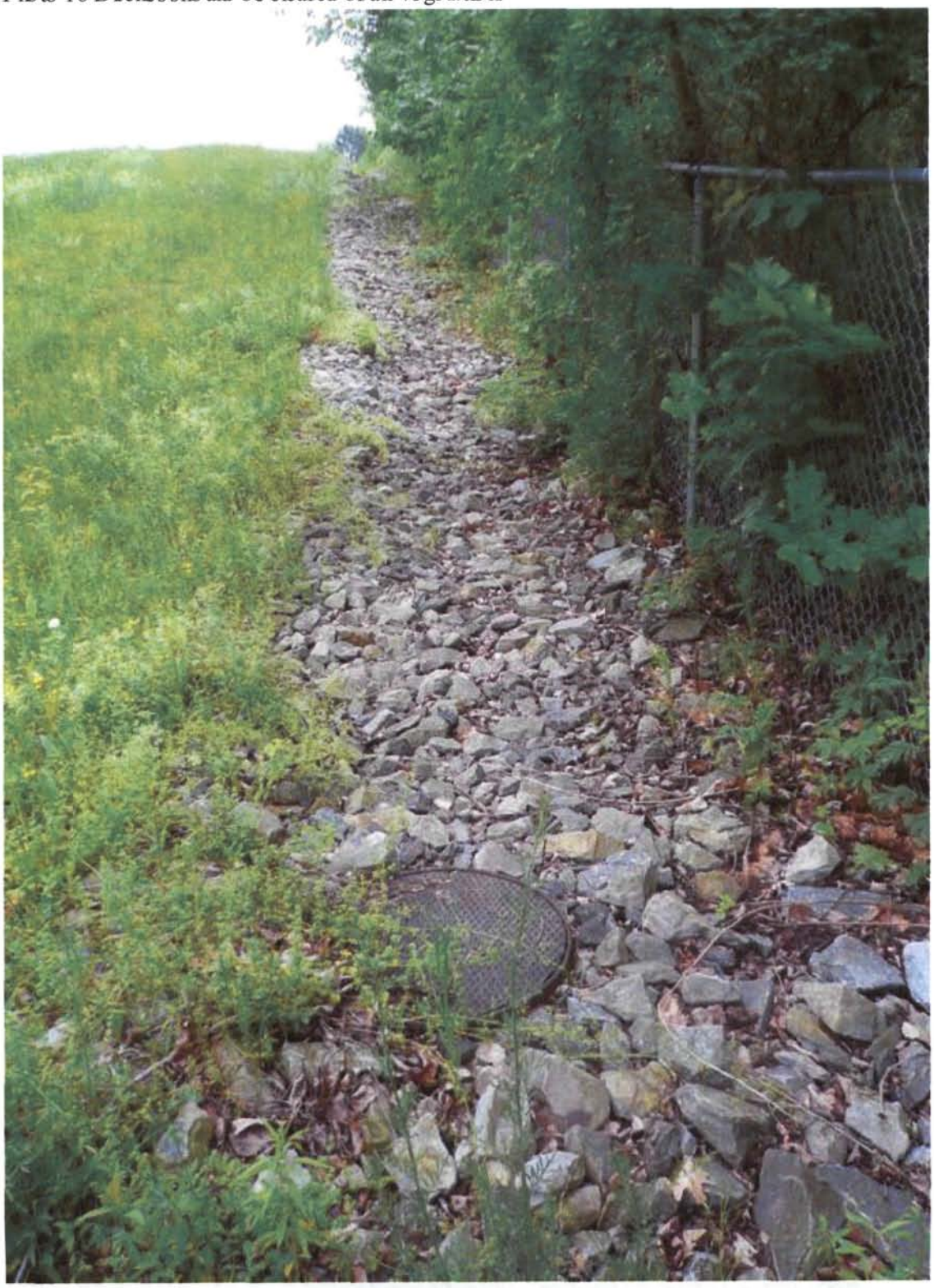


Photo 17 Swale is partially blocked by vegetation.

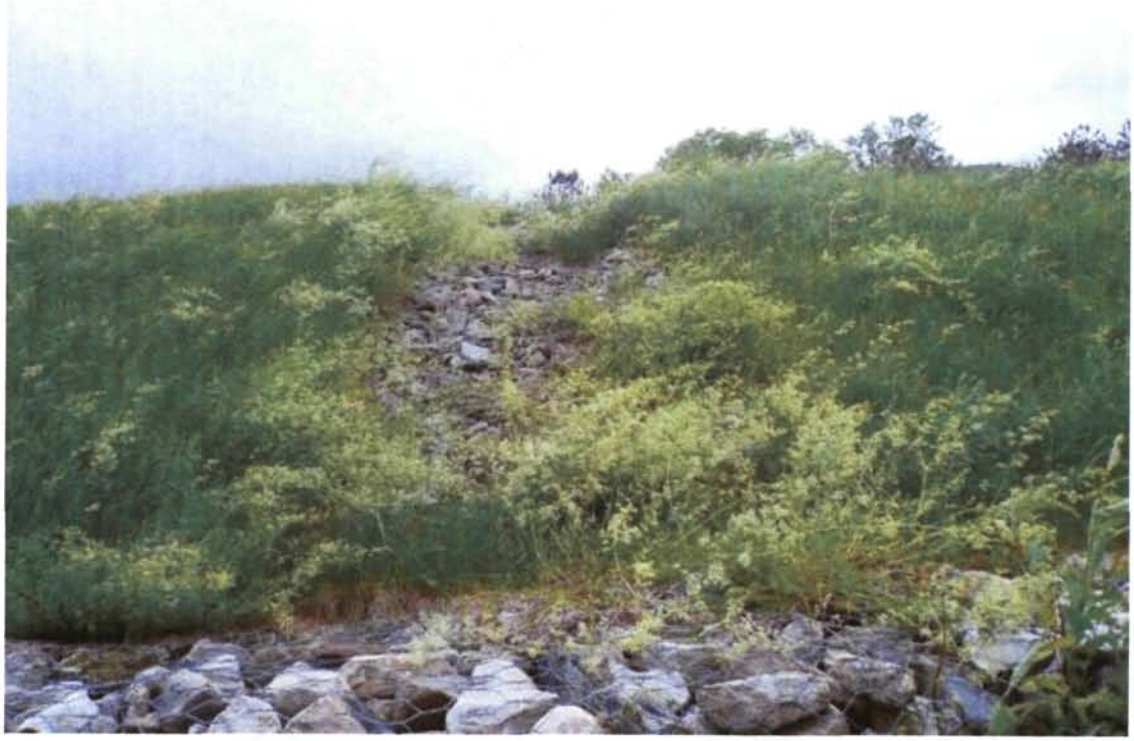


Photo 18 Vegetation growing through riprap should be removed.

Photo 19 Vegetation growing through the perimeter fence should be cleared.

Photo 20 Large trees and bushes should be cleared at least 3 ft from either side of fence.

POWNAL SUPERFUND SITE

FORMER MILL BUILDING AREA

PHOTOS FROM JUNE 9, 2009 SITE VISIT

Photo 21 Well kept bench and sign.

Photo 22 Recently mowed area.

Photo 23 Retaining wall appears structurally sound and stable.

Attachment 3
Interview Records

INTERVIEW RECORD

Site Name: Pownal Tannery Site		EPA ID No.:
Subject: 5-Yr Review		Time: Date: 7/8/07
Type: ☐ Telephone ☐ Visit ☐ Other Location of Visit:		☐ Incoming ☐ Outgoing

Contact Made By:

Name: Amy Hamilton	Title: Proj. Engineer	Organization: TRC

Individual Contacted:

Name: Bobby Higgins	Title: Resident	Organization:
Telephone No: 802-823-7853 Fax No: E-Mail Address:	Street Address: City, State, Zip:	

Summary Of Conversation

Unable to contact.

Page 1 of ____

INTERVIEW RECORD

Site Name: Pownal Tannery Site		EPA ID No.:
Subject: 5-Yr Review	Time: 1400	Date: 7/8/09
Type: ☒ Telephone ☐ Visit ☐ Other Location of Visit:		☐ Incoming ☐ Outgoing

Contact Made By:

Name: Amy Hamilton	Title: Proj. Engineer	Organization: TRC

Individual Contacted:

Name: Leslie McVicker	Title: EPA RPM	Organization: EPA
Telephone No: 617-918-1374 Fax No: E-Mail Address:	Street Address: City, State, Zip:	

Summary Of Conversation

Overall sentiment that the project was successful. No community concerns, no incidents; Feels well informed regarding the site's maintenance. Institutional controls will be complete in 2010 at both landfill locations.

Page 1 of ____

INTERVIEW RECORD

Site Name: Pownal Tannery Superfund Site		EPA ID No.:
Subject: 5-Yr Review	Time:	Date: 6/24/09
Type: ☒ Telephone ☐ Visit ☐ Other Location of Visit:	☐ Incoming	☐ Outgoing

Contact Made By:

Name: Amy Hamilton	Title: Proj. Engineer	Organization: TRC

Individual Contacted:

Name: Linda Scrafford	Title: Adm. Assistant	Organization: Town of Pownal
Telephone No: 802-823-0132 Fax No: E-Mail Address:	Street Address: City, State, Zip:	

Summary Of Conversation

Very positive comments. The site is being used in a way that benefits the town. WWTP is operating. Recreational uses are being planned.

No concerns regarding the operation and administration of the site

Page 1 of 1

INTERVIEW RECORD

Site Name: Pownal Tannery Superfund Site		**EPA ID No.:**
Subject: 5-yr Review Interview	**Time:** 0845	**Date:** 7/6/09
Type: ☒ Telephone ☐ Visit ☐ Other **Location of Visit:**	☐ Incoming ☐ Outgoing	

Contact Made By:

Name: Amy Hamilton	**Title:** Proj. Engineer	**Organization:** TRC

Individual Contacted:

Name: Brian Woods	**Title:**	**Organization:** VT DEC
Telephone No: 802-241-3885 **Fax No:** **E-Mail Address:** Brian.woods@state.vt.us	**Street Address:** 103 South Main Street/West **City, State, Zip:** Waterbury, VT 05671-0404	

Summary Of Conversation

Successful remediation: no evidence of pathways to exposure; not an excessive financial burden to the State conducting O&M @ 2 landfill areas (cost ~$25 K); no major event has effected the integrity of the cap; state is working well with the local police department to keep motorized vehicles off the cap. The 2004 berm breach is providing improved floodplain access + pre-lagoon river dynamics are being restored. Overall a good, cost-effective solution that accomplished the req'd goals. WWTP now operating onsite — effective reuse.

Attachment 4
Summary of ARARs

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
LOCATION – SPECIFIC						
Federal Regulatory Requirements	Wetlands, Floodplains, Streams, or Water Body	NO LONGER A PROMULGATED STANDARD				
State Regulatory Requirements		Vermont Wetland Rules (adopted under 10 VSA sec. 905)	Applicable	These regulations establish criteria for delineating Class One, Class Two and Class Three wetlands. Class One and Class Two wetlands, which are considered significant wetlands that merit protection, and set forth allowed and conditional uses for these wetlands. The uses must not have undue adverse impacts on the significant functions of the wetland. Class Three wetlands are not protected under these rules; however, they may be protected by other federal, state, or local regulations.	Alternative-4 involves destruction of State-regulated Class Three wetlands in Lagoons 1 and 5 but the state indicated that replacement of these wetlands is not necessary due to low function and the man-made nature, so this Alternative would comply with this requirement.	There is no change from the ROD and ESD description. VTDEC determined that no wetland mitigation measures were needed as part of the implementation of the remedy. Standards will be met in regards to long-term operation and maintenance.
		Land Use and Development – Act 250 (10 VSA 6086)	Applicable	This stature requires that developments protect a number of land use criteria including: Streams, floodways, shorelines, wetlands, erosion control, and historic sites.	Substantive standards regarding criteria under the Act will be addressed by the remedial action including: air and water pollution, floodways, streams, shorelines, wetlands, and erosion control.	The substantive standards were addressed as part of the former lagoon cap design and construction and will continue to be met in regards to long-term operation and maintenance.
CHEMICAL – SPECIFIC						
Federal Criteria, Advisories, and Guidance	Soil/Sediment	NOAA Effects Range-Low and Median (ER-L and ER-M) values for marine and estuarine sediments	To be considered	The ER-L value is equivalent to the lower 10th percentile of the available toxicity data, which is estimated to be the approximate concentration at which adverse effects are likely to occur in sensitive life stages and/or	The ER-L value was used for selecting Chemicals of Potential Concern and for characterizing ecological effects.	These criteria were used in the ecological risk assessment for selection of sediment COPCs. These criteria are still to be

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
				species of sediment-dwelling organisms.		considered in the evaluation of long-term sediment monitoring data.
		OSWER Directive 9200.4-26, Approaches' for Addressing Dioxins in Soil at CERCLA and RCRA Sites (Apr. 13, 1998)	To be considered	This Directive provides guidance in establishing cleanup levels for dioxins. A 1 ug/kg (ppb) concentration of dioxins (as 2,3,7,8-TCDD TE) has been established for surficial soils involving residential exposure scenarios. A cleanup range of 5 to 20 ug/kg of dioxin (as 2,3,7,8-TCDD TE) was established for commercial and industrial exposure scenarios.	This OSWER policy was used to establish dioxin PRGs for Site remediation.	The 1 ug/kg level was established as the soil cleanup level for dioxin TEQ. Soils containing contaminants in excess of the 1 ug/kg dioxin level and other risk-based PRGs were excavated and consolidated beneath the low-permeability cap.
		EPA Carcinogenicity Slope Factor	To be considered	Slope factors are developed by EPA from health effects assessments. Carcinogenic effects present the most up-to-date information on cancer risk potency. Potency factors are developed by EPA from Health Effects Assessments of evaluation by the Carcinogenic Assessment Group.	Site related risks due to carcinogens were noted in the Human Health Risk Assessment. Alternative-4 includes actions (capping) to prevent exposure to contaminants that were identified to cause risks, so this Alternative will comply with this requirement.	See review of risk assessments.
		EPA Risk Reference Dose (RfDs)	To be considered	RfDs are considered to be the levels unlikely to cause significant adverse health effects associated with a threshold mechanism of action in human exposure for a lifetime.	No site related risks due to non-carcinogens were noted in the Human Health Risk Assessment. Alternative-4 includes actions (capping) to prevent exposure to contaminants that were identified to cause risks, so this Alternative will comply with this requirement.	See review of risk assessments.
		Ontario Ministry of Environment and Energy (OMEE) "Guidelines for the	To be considered	The LEL value is the concentration at which the majority of the sediment-dwelling organisms are not	The LEL value was used for selecting Chemicals of Potential Concern and for characterizing	These criteria are still to be considered in the evaluation of

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
		Protection and Management of Aquatic Sediment Quality in Ontario," Lowest and Severe Effect Levels (LELs and SELs) for Freshwater Sediments (August 1993)		affected.	ecological effects.	long-term sediment monitoring data.
ACTION – SPECIFIC						
Federal Regulatory Requirements	Surface Water	CWA Ambient Water Quality Criteria (AWQC) (40 CFR 120)	Relevant and Appropriate	Remedial actions involving contaminated surface water or groundwater must consider the uses of the water and the circumstances of the release or threatened release. Federal AWQC are health-based and ecologically based criteria developed for carcinogenic and non-carcinogenic compounds.	Long-term monitoring will demonstrate future compliance with this requirement.	Contaminated water generated from dewatering during construction activities in the former lagoon area was treated to remove PAHs, dioxins, and metals prior to discharge to the Hoosic River. The remedy was constructed and is being maintained to prevent contaminated runoff to the Hoosic River. Long-term monitoring of surface water was not required in the ROD.

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
		Clean Water Act National Pollutant Discharge Elimination System (NPDES) (40 CFR Parts 122 and 125)	Applicable	Establishes the specifications for discharging pollutants from any point source into the waters of the U.S.	Point source discharges anticipated during construction will be managed in accordance with these requirements.	The substantive requirements were met during remedy construction in the former lagoon area. Water generated from dewatering activities was treated to remove PAHs, dioxins, and metals prior to discharge to the Hoosic River. These requirements will continue to be met in regards to long-term operation and maintenance.
Federal Regulatory Requirements	(Not in ROD Summary) Groundwater Monitoring	(Not in ROD Summary) SDWA - Maximum Contaminant Levels (MCLs) (49 CFR 141.1-141.16)	(Not in ROD Summary) Relevant and Appropriate	(Not in ROD Summary) Establishes MCLs for common organic and inorganic contaminants applicable to public drinking water supplies. Used as relevant and appropriate cleanup standards for aquifers and surface water bodies that are potential drinking water sources.	(Not in ROD Summary) Long term monitoring will demonstrate future compliance with this requirement.	The current MCLs are considered relevant and appropriate for comparison to groundwater data for residential drinking water wells that are sampled annually. VTDEC's annual O&M reports assess compliance with MCLs. Additional compliance monitoring is needed outside of the compliance area for the Dean Road Landfill. Exceedances of these standards was identified in the Former Mill/Wood Road Area and will

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
						need to be addressed in a future decision document.
	(Not in ROD Summary) Groundwater Monitoring	(Not in ROD Summary) SDWA - Maximum Contaminant Levels (MCLs) (49 CFR 141.1-141.16)	(Not in ROD Relevant and Appropriate	(Not in ROD Summary) Establishes MCLGs for public water supplies. Non-zero MCLGs are health-based criteria are considered when evaluating drinking water sources. These unenforceable health goals are available for a number of organic and inorganic compounds.	(Not in ROD Summary) Long term monitoring will demonstrate future compliance with this requirement.	The current nonzero MCLGs are considered for comparison to groundwater monitoring data for residential drinking water wells that are sampled annually. VTDEC's annual O&M reports assess compliance with MCLGs. Additional compliance monitoring is needed outside of the compliance area for the Dean Road Landfill. Exceedances of these standards was identified in the Former Mill/Wood Road Area and will need to be addressed in a future decision document.
	Groundwater Monitoring	(Not in ROD Summary) Health Advisories (EPA Office of Drinking Water)	(Not in ROD Summary) To be Considered	(Not in ROD Summary) Health Advisories are estimates of risk due to consumption of contaminated drinking water; they consider non-carcinogenic effects only. To be considered for contaminants in groundwater that may be used for drinking water where the standard is more conservative than either federal or	(Not in ROD Summary) Long term monitoring will demonstrate contaminated groundwater is not migrating outside of the compliance zones for the capped landfills.	See previous comments for the MCLs.

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
				state statutory or regulatory standards (in particular for manganese).		
Vermont Regulatory Requirements	Surface Water/ Groundwater	Vermont Solid Waste Management Rules, EPR Chapter 6 (adopted under 10 VSA Chapter 159), Closure and Post-Closure, Subchapter 10.	Applicable	Requires the control, minimization or elimination of emissions or discharges of waste, waste constituents, leachate, contaminated runoff, and/or waste decomposition products to the groundwater or surface waters or atmosphere.	Alternative-4 includes a cover system for the waste in place at the site. The cover system design will be developed to comply with this requirement.	The Dean Road landfill cap includes a leachate collection system. Both the Dean Road landfill cap and the former lagoon area cap include passive gas venting. As part of O&M activities, VTDEC performs landfill gas, groundwater, and sediment monitoring; and leachate collection and disposal. These requirements remain applicable and are being complied with. Long-term operation and maintenance, institutional controls (once established), and long-term monitoring of the capped landfills will continue to meet these standards. Groundwater monitoring outside of compliance area for the Dean Road Landfill needs to be established.
	Surface Water	Vermont Water Quality Standards adopted under 10	Applicable	These standards establish water quality criteria for the maintenance of	Long-term monitoring will demonstrate future compliance with	Contaminated water generated from

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
		VSA Chapter 47 (EPR Chapter 1)		water quality and rules for determining acceptable point- and non-point-source discharges to the state's surface waters. Minimum water quality criteria are established. Specifies Federal AWQC to be used for effluent discharge limits or, where Federal limits are not available or are invalid, development of site-specific limits.	this requirement.	dewatering during construction activities in the former lagoon area was treated to remove PAHs, dioxins, and metals prior to discharge to the Hoosic River. The remedy was constructed and is being maintained to prevent contaminated runoff to the Hoosic River. These requirements will continue to be met in regards to long-term operation and maintenance. Long-term monitoring of surface water was not required in the ROD.

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
		Vermont Solid Waste Management Rules, EPR Chapter 6 (adopted under 10 VSA Chapter 159), Design Standards, Subchapter 6, Operation Standards, Subchapter 7 (EPR 6-502, 503)	Applicable	These regulations outline siting criteria for solid waste management facilities or facilities improvement. Under the Rules solid waste facilities should not be sited in: Class III wetlands, in a 100-year floodplain, within 6 feet of the seasonal high groundwater level, within 300 feet of waters of the State, within 1,000 feet of a drinking water source, and within 50 feet of a property line. Also, a facility is required to have a liner and a leachate collection system. However, a waiver may be granted from these standards upon a finding that: 1) the proposed Alternative measures to the requirements will not endanger or tend to endanger human health or safety; 2) compliance with VT the specific standards would produce serious hardship by delaying the remedy and increasing costs significantly without equal or greater benefit to the public; 3) the material at the Site is not considered to be a hazardous waste subject to regulation under the Resource Conservation and Recovery Act (RCRA) Subtitle C; and 4) there is no practicable means known or available to meet both on-site disposal of the waste and certain requirements of the VT SWMR, however, the substitute or Alternative measures proposed in this cleanup plan would achieve an equivalent level of protection of public health and the environment.	Alternative-4 will result in the existing sludge lagoon system being consolidated and closed as a solid waste facility within the 100-year floodplain, without meeting the specifics standards under the Rules noted in the Requirement Synopsis. However, EPA has invoked the waiver provision because Alternative-4 will remove contamination from the higher energy floodway and consolidate the waste into one capped disposal facility that will be designed, constructed, and maintained to prevent erosion of the cap during flood events. Performance objectives for the landfill cap will be to prevent infiltration of surface water into the consolidated wastes, prevent releases of material through erosion and other causes, and prevent movement of wastes into the groundwater and adjacent Hoosic River. Alternative-4 will be protective of public health, safety, and the environment and will meet all of the Rule's standards for waiving specific provisions. There are no practicable Alternatives to meet both on-site disposal of the waste and the specific requirements under the Rules.	As described in the ROD, the former lagoon area cap was constructed within the 100-year flood plain. However, the cap was designed and constructed to be protective of public health, safety, and the environment and EPA invoked waiver provisions within the Rules. This requirement is currently being complied with as the cap is being maintained to prevent infiltration of surface water into the consolidated wastes and prevent releases of consolidated wastes.

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
Vermont Regulatory Requirements	Groundwater Monitoring	(Not in ROD Summary) Vermont Groundwater Protection Rule and Strategy, EPR Ch. 12 (10 VSA Sec. 1390-1394)	(Not in ROD Summary) Relevant and Appropriate	(Not in ROD Summary) These standards consist of ground water classifications, water quality criteria necessary to sustain the designated uses, and regulations to achieve the designated uses or maintain existing ground water quality. Establishes standards for ground water monitoring.	(Not in ROD Summary) Long term monitoring will demonstrate contaminated groundwater is not migrating outside of the compliance zones for the capped landfills.	The current rule was made effective in February 2005. Interim Groundwater Quality Standards for a short-list of compounds were subsequently issued in March 2009 as guidance. Long-term groundwater monitoring data from monitoring wells and residential wells are compared to the current Primary and Secondary Enforcement Standards and Preventative Action Levels provided in this rule as part of VTDEC's annual O&M reports. Additional compliance monitoring is needed outside of the compliance area for the Dean Road Landfill. Exceedances of these standards was identified in the Former Mill/Wood Road Area and will need to be addressed in a future decision document.

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
	Groundwater Monitoring	(Not in ROD Summary) Vermont Water Supply Rule – EPR Ch. 21, Subchapter 6 (10 VSA Ch. 48, 56, 61 and 18 V.S.A. Sec. 1218)	(Not in ROD Summary) Relevant and Appropriate	(Not in ROD Summary) Establishes maximum contaminant levels and goals that apply to public drinking water supplies. Vermont Maximum Contaminant Levels and Maximum Contaminant Level Goals are specified for inorganic and organic chemicals. For the most part, the numerical criteria are identical to Federal SDWA MCLs and MCLGs.	(Not in ROD Summary) Long term monitoring will demonstrate contaminated groundwater is not migrating outside of the compliance zones for the capped landfills.	See previous comments for the VT Groundwater Protection Rule.

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
Vermont Criteria, Advisories, and Guidance	Groundwater Monitoring	Vermont Department of Health Drinking Water Guidance (October 2000)	To be considered	Lists the Vermont Health Advisories (VHAs) for chemicals of concern in drinking water. Vermont Health Advisories are researched and calculated concentrations of chemicals in drinking water in instances where the chemicals do not have a MCL. The Vermont Health Advisories are a tool for risk assessment and should provide a margin of safety to people consuming water below these levels. If an advisory is exceeded, it does not necessarily follow that adverse health effects will occur, but that further evaluation of the water supply is warranted.	There are no persistent, site related exceedances of VHAs at the site. Long-term monitoring will demonstrate future compliance with this requirement.	This guidance was most recently updated in December 2002 and should be considered in evaluating groundwater monitoring data for which VTDEC Groundwater Enforcement Standards, MCLs, or other federal standards are not available.

ARAR and TBC Summary for Alternative-4, Consolidation and Capping						
Site Feature/ Authority	**Media (from ROD)**	**Requirements (from ROD)**	**Status (from ROD)**	**Requirement Synopsis (from ROD)**	**Action to be taken to attain ARAR (from ROD)**	**Five-Year Review**
Ontario Quality Guidelines	Sediment	Ontario Ministry of Environment and Energy "Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario," Lowest and Severe Effect Levels (LELs and SELs) for Freshwater Sediments (August 1993)	(Not in ROD summary) To be considered	(Not in ROD summary) The LEL value is the concentration at which the majority of the sediment-dwelling organisms are not affected.	The LEL value was used for selecting Chemicals of Potential Concern and for characterizing ecological effects.	These criteria are still to be considered in the evaluation of long-term sediment monitoring data.

Attachment 5
Historical Groundwater Concentrations

TABLE 11. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-201)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID.						MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201
Sample Collection Date:						3/26/2005	6/27/2005	6/27/2005	9/18/2005	9/18/2005	12/13/2005	4/18/2006	7/11/2006	9/22/2006	12/27/2006	6/19/2007	6/19/2008
Analyte	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary													
		VGES	PAL	VGES	PAL												
Initial Depth-to-Water Reading (FT BTOC)							10.99	--	11.54	--	9.32	9.74	9.81	10.43	9.25	10.21	10.22
Final Field Parameters																	
pH (su)	Field	--	--	--	--	7.13	7.85	7.85	7.11	NA	7.18	7.13	4.06**	7.37	7.46	7.24	7.46
Specific Conductance (uS/cm)	Field	--	--	--	--	414.3	571.2	571.2	548.0	NA	426.0	396.0	473.0	505.0	461.0	475.0	432
Turbidity (NTU)	Field	--	--	--	--	1.2	21.6	21.6	62.6	NA	9.2	10	2	3.0	9.0	6.0	9.8
Dissolved Oxygen (mg/L)	Field	--	--	--	--	2.48	0.14	0.14	5.33	NA	0.10	0.20	0.3	5.40	0.90	0.10	1.0
Temperature (°C)	Field	--	--	--	--	7.63	15.02	15.02	60.80	NA	50.30	50.10	56.80	55.80	49.40	58.50	57.0
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-96	-252	-252	-187	NA	-160	-133	-95	-126	-61	-144	-120
VOCs																	
Acetone	SW8260B	700.0	350.0	--	--	ND< 10	ND< 10	NA	ND< 10	NA	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10
Chlorobenzene	SW8260B	100.0	50.0	--	--	ND< 2.0	ND< 2.0	NA	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
1,3,5-Trimethylbenzene	SW8260B	350.0	175.0	--	--	ND< 2.0	2.9	NA	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
1,2,4-Trimethylbenzene	SW8260B	350.0	175.0	--	--	3.4	12	NA	12	NA	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
1,2-Dichlorobenzene	SW8260B	600.0	300.0	--	--	4.0	5.3	NA	5.2	NA	2.1	2.7	2.2	2.2	4.2	4.9	4.7
SVOCs																	
Bis(2-ethylhexyl)phthalate	SW8270C	6.0	3.0	--	--	ND	ND	NA	ND	NA	15	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides																	
(None Detected)	SW8081A	Not Applicable		--	--	ND	ND	NA	ND	NA	ND	ND	ND	ND	ND	NA	NA
Dioxins																	
Total 2,3,7,8-TCDD Equivalence	8290	3.0E-05	1.1E-05	--	--	3.7E-07	1.4E-06	NA	7.1E-07 JB	NA	2.8E-07 J	3.1E-08 J	7.0E-08 JB	3.3E-08 JB	0.0E+00	NA	NA
Metals																	
Aluminum	SW6010B	--	--	200	100	ND< 200	805	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	60,000	67,700	66,900	63,400	66,100	69,200	60,900	71,700	76,100	52,200	NA	NA
Chromium	SW6010B	100.0	50.0	--	--	ND< 10	16.1	ND< 10	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Iron	SW6010B	--	--	300	150	2,780	1,530	742	373	487	5,030	2,520	2,780	2,740	116	NA	NA
Magnesium	SW6010B	--	--	--	--	9,280	9,060	8,670	10,100	10,100	9,780	9,490	10,100	9,980	10,300	NA	NA
Manganese	SW6010B	840	420	50	25	2,860	4,500	4,660	3,870	4,220	3,250	2,550	4,030	4,860	ND< 15.0	3,080	3,260
Potassium	SW6010B	--	--	--	--	ND< 2,500	2,920	2,620	3,070	2,770	3,900	2,900	3,040	3,380	3,540	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	26,400	34,800	34,800	31,900	28,300	22,200	18,800	22,700	22,300	18,700	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	ND< 20	ND< 20	ND< 20	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5	ND< 5	ND< 5	ND< 5.00	ND< 5.0	6.99	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	11.7
Cyanide	E335.2	200.0	100.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell. All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 12. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-202)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202
Sample Collection Date:						3/27/2005	6/28/2005	9/18/2005	12/13/2005	4/18/2006	7/11/2006	9/22/2006	12/28/2006	6/19/2007	6/19/2008
Analyte	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary											
		VGES	PAL	VGES	PAL										
Initial Depth-to-Water Reading (FT BTOC)							9 99	10 71	8 24	8 60	8 61	9 20	8 07	9 03	9 02
Final Field Parameters															
pH (su)	Field	--	--	--	--	7 05	7 05	6 01	7 17	7 15	4 85**	5 66	7 31	6 47	7 19
Specific Conductance (uS/cm)	Field	--	--	--	--	424.6	505.2	461 0	442 0	384.0	NA	486.0	463 0	490.0	385
Turbidity (NTU)	Field	--	--	--	--	0.3	5 6	3 1	0.8	3	2	1.0	1 7	0 0	0.9
Dissolved Oxygen (mg/L)	Field	--	--	--	--	3 06	0 12	0.21	0.10	0 20	0 1**	0 20	0.30	0 10	1 0
Temperature (°c)	Field	--	--	--	--	7 38	12 91	57.20	47.30	46 9	56 4	57 80	48.40	57 68	52 5
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-88	-97	-67	-122	-121	-89	-103	-65	-117	-109
VOCs															
Acetone	SW8260B	700.0	350 0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10
Chlorobenzene	SW8260B	100.0	50 0	--	--	2.5	ND< 2 0	ND< 2 0	ND< 2 0	2.0	ND< 2 0	2.4	2.1	ND< 2 0	ND< 2 0
1,3,5-Trimethylbenzene	SW8260B	350 0	175.0	--	--	ND< 2 0	ND< 2 0	ND< 2.0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2.0	ND< 2 0	ND< 2 0
1,2,4-Trimethylbenzene	SW8260B	350.0	175 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0
1,2-Dichlorobenzene	SW8260B	600 0	300 0	--	--	2.2	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2.0	ND< 2.0
SVOCs															
(None Detected)	SW8270C	Not Applicable		--	--	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides															
(None Detected)	SW8081 A	Not Applicable		--	--	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Dioxins															
Total 2,3,7,8-TCDD Equivalence	8290	3.0E-05	1.1E-05	--	--	0 0E+00	0.0E+00	**6.6E-07 JB**	0.0E+00	0.0E+00	**8.7E-08 JBI**	**7.9E-08 JB**	0 0E+00	NA	NA
Metals															
Aluminum	SW6010B	--	--	200	100	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	**65,500**	**68,200**	**62,700**	**72,300**	**63,600**	**70,900**	**69,400**	**77,000**	NA	NA
Chromium	SW6010B	100 0	50.0	--	--	ND< 10	ND< 10	ND< 10 0	ND< 10 0	ND< 10.0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10.0
Iron	SW6010B	--	--	300	150	**5,380**	**5,430**	**13,200**	**7,790**	**3,840**	**5,160**	**4,220**	**4,170**	NA	NA
Magnesium	SW6010B	--	--	--	--	**9,660**	**10,000**	**11,000**	**10,000**	**9,390**	**9,790**	**9,360**	**11,100**	NA	NA
Manganese	SW6010B	840	420	50	25	**3,380**	**3,460**	**4,800**	**4,160**	**2,920**	**3,510**	**3,270**	**3,440**	**3,400**	**3,210**
Potassium	SW6010B	--	--	--	--	**3,220**	**3,300**	ND< 2,500	**3,140**	ND< 2,500	**3,240**	**3,390**	**3,110**	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**29,700**	**31,300**	**23,700**	**27,800**	**19,300**	**28,000**	**27,500**	**26,100**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	ND< 20	ND< 20	ND< 20.0	ND< 20 0	ND< 20 0	ND< 20.0	ND< 20 0	**22.6**	ND< 20 0	ND< 20 0
Arsenic	SW7060A	10.0	1 0	--	--	**16.8**	**17.7**	**17.4**	**22.5**	**11.9**	**16.4**	**19.8**	**14.3**	**14.3**	**10.2**
Cyanide	E335 2	200.0	100.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCS = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 13. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-203)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-203	MW-203	MW-203	MW-203	MW-203	MW-203	MW-203	MW-203	MW-203	MW-203
Sample Collection Date:						3/27/2005	6/28/2005	9/18/2005	12/14/2005	4/19/2006	7/11/2006	9/22/2006	12/28/2006	6/19/2007	6/19/2008
Analyte	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary											
		VGES	PAL	VGES	PAL										
Initial Depth-to-Water Reading (FT BTOC)							7.99	8.65	6.35	6.82	6.65	7.45	6.25	7.42	7.42
Final Field Parameters															
pH (su)	Field	--	--	--	--	6.74	6.56	6.54	6.94	6.94	5.38**	NA	7.07	6.13	6.76
Specific Conductance (uS/cm)	Field	--	--	--	--	302.0	381.8	407.0	317.0	314.0	359.0	361.0	415.0	338.0	279
Turbidity (NTU)	Field	--	--	--	--	0.7	8.2	7.0	9.8	6	2	2.0	2.7	0.0	5.7
Dissolved Oxygen (mg/L)	Field	--	--	--	--	9.32	4.36	2.40	3.90	4.70	0.1**	2.20	4.90	0.70	4.1
Temperature (°C)	Field	--	--	--	--	7.25	11.64	57.50	45.60	46.3	53.8	57.00	49.00	57.20	52.7
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	206	103	-3	235	147	124	72	161	57	108
VOCs															
Acetone	SW8260B	700.0	350.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10
Chlorobenzene	SW8260B	100.0	50.0	--	--	ND< 2.0	ND< 2.0	ND< 2	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
1,3,5-Trimethylbenzene	SW8260B	350.0	175.0	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
1,2,4-Trimethylbenzene	SW8260B	350.0	175.0	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
1,2-Dichlorobenzene	SW8260B	600.0	300.0	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
SVOCs															
(None Detected)	SW8270C	Not Applicable		--	--	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides															
(None Detected)	SW8081A	Not Applicable		--	--	ND	ND	ND	ND	ND	ND	ND	ND< 0.0073	NA	NA
Dioxins															
Total 2,3,7,8-TCDD Equivalence	8290	3.0E-05	1.1E-05	--	--	**1.3E-07**	**9.1E-08**	**4.7E-08 JB**	**2.8E-08 J**	0.0E+00	**2.3E-07 JBA**	**6.9E-08 JB**	0.0E+00	NA	NA
Metals															
Aluminum	SW6010B	--	--	200	100	**530**	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	**55,600**	**56,400**	**56,400**	**52,200**	**53,700**	**57,800**	**55,300**	**73,400**	NA	NA
Chromium	SW6010B	100.0	50.0	--	--	**10.6**	ND< 10	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	**26.2**	ND< 10.0	ND< 10.0
Iron	SW6010B	--	--	300	150	**1,290**	ND< 100	ND< 100	**143**	ND< 100	**119**	ND< 100	ND< 100	NA	NA
Magnesium	SW6010B	--	--	--	--	**11,400**	**11,900**	**11,900**	**9,850**	**11,500**	**11,400**	**10,400**	**13,200**	NA	NA
Manganese	SW6010B	840	420	50	25	**130**	**120**	**164**	**16.7**	ND< 15.0	ND< 15.0	**24.1**	**52.4**	**28.9**	**19.6**
Potassium	SW6010B	--	--	--	--	**4,500**	**2,800**	**3,060**	**3,080**	ND< 2,500	**2,570**	**2,940**	**4,630**	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**17,800**	**21,600**	**22,900**	**18,300**	**15,900**	**19,400**	**19,800**	**17,800**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	ND< 20	ND< 20	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5	ND< 5	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00
Cyanide	E335.2	200.0	100.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes.
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell. All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 16. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-104U)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-104U*	MW-104U*	MW-104U	MW-104U	MW-104U	MW-104U	MW-104U	MW-104U	MW-104U	MW-104U	MW-104U	MW-104U
Sample Collection Date:						3/27/2005	3/27/2005	6/28/2005	9/19/2005	12/14/2005	12/14/2005	4/19/2006	7/12/2006	9/22/2006	12/28/2006	6/20/2007	6/19/2008
Analyte	**Analytical Method**	**Ground Water Quality Standards**				(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		**Secondary**													
		VGES	**PAL**	**VGES**	**PAL**												
Initial Depth-to-Water Reading (FT BTOC)								7.55	7.80	5.72	–	5.67	6.01	5.97	4.08	6.20	5.99
Final Field Parameters																	
pH (su)	Field	–	–	–	~	6.90	6.90	6.82	5.25	6.92	NA	6.97	6.80	NA	7.05	6.33	6.10
Specific Conductance (uS/cm)	Field	–	–	–	~	294.1	294.1	422.5	409.0	329.0	NA	358.0	350.0	340.0	304.0	364.0	333
Turbidity (NTU)	Field	–	–	–	~	22.0	22.0	9.5	8.0	20.0	NA	10	9	10.0	8.7	5.5	9.3
Dissolved Oxygen (mg/L)	Field	–	–	–	~	9.55	9.55	3.85	2.00	0.80	NA	1.20	0.1**	0.60	0.50	0.60	2.2
Temperature (°C)	Field	–	–	–	~	5.54	5.54	17.03	60.43	47.30	NA	45.2	57.2	59.80	47.60	55.30	51.8
Oxidation-Reduction Potential (mv)	Field	–	–	–	~	55	55	92	-98	-12	NA	-6	-24	51	13	-14	-3
VOCs																	
Acetone	SW8260B	700.0	350.0	–	~	ND< 10	NA	ND< 10	ND< 10	ND< 10	NA	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA
Chlorobenzene	SW8260B	100.0	50.0	–	~	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
1,3,5-Trimethylbenzene	SW8260B	350.0	175.0	–	~	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
1,2,4-Trimethylbenzene	SW8260B	350.0	175.0	–	~	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
1,2-Dichlorobenzene	SW8260B	600.0	300.0	–	~	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	NA	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
SVOCs																	
(None Detected)	SW8270C	Not Applicable		–	~	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides																	
(None Detected)	SW8081A	Not Applicable		–	~	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA
Dioxins																	
Total 2,3,7,8-TCDD Equivalence	8290	3.0E-05	1.1E-05	–	~	0.0E+00	NA	0.0E+00	**9.5E-08 JB**	**4.2E-07 J**	NA	0.0E+00	**9.0E-08 JBA**	0.0E+00	0.0E+00	NA	NA
Metals																	
Aluminum	SW6010B	–	–	200	100	ND< 200	**322**	ND< 200	**281**	ND< 200	ND< 200	**322**	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	–	–	–	–	**56,500**	**55,100**	**58,100**	**56,800**	**55,100**	**59,100**	**66,400**	**55,400**	**51,900**	**57,200**	NA	NA
Chromium	SW6010B	100.0	50.0	–	–	ND< 10	ND< 10	ND< 10	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Iron	SW6010B	–	–	300	150	**410**	**1,320**	**497**	**3,460**	**1,620**	**1,090**	**2,600**	**1,840**	**845**	**2,250**	NA	NA
Magnesium	SW6010B	–	–	–	–	**10,500**	**10,600**	**10,000**	**9,540**	**8,710**	**9,220**	**10,900**	**8,870**	**9,530**	**9,680**	NA	NA
Manganese	SW6010B	840	420	50	25	**424**	**513**	**2,350**	**3,160**	**884**	**973**	**1,230**	**969**	**226**	**1,070**	**980**	**784**
Potassium	SW6010B	–	–	–	–	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	NA	NA
Sodium	SW6010B	–	–	250,000	125,000	**15,900**	**15,600**	**21,500**	**21,700**	**15,200**	**16,200**	**20,100**	**19,900**	**15,900**	**13,900**	NA	NA
Zinc	SW6010B	–	–	5,000	2,500	ND< 20	**20.4**	**22.2**	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	**35.8**	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	–	–	ND< 5	ND< 5	ND< 5	ND< 5.00	ND< 5.00	ND< 5.00	**5.96**	**6.28**	ND< 5.00	**5.08**	ND< 5.00	ND< 5.00
Cyanide	E335.2	200.0	100.0	–	–	**11**	NA	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell. All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard
* Results of unfiltered and filtered samples for MW-104U suggest sample lables were switched - filtered metal concentrations should not be greater than unfiltered concentrations.

TABLE 15. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-L-4)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-L-4	MW-L-4	MW-L-4	MW-L-4	MW-L-4	MW-L-4	MW-L-4	MW-L-4	MW-L-4	MW-L-4	MW-L-4
Sample Collection Date:						3/27/2005	6/28/2005	9/18/2005	12/15/2005	12/15/2005	4/19/2006	7/12/2006	9/22/2006	12/28/2006	6/20/2007	6/19/2008
Analyte	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary												
		VGES	PAL	VGES	PAL											
Initial Depth-to-Water Reading (FT BTOC)							19 25	19 57	17 84	–	18 25	18 19	18 58	17 72	18 76	18 28
Final Field Parameters																
pH (su)	Field	–	–	–	–	6.53	6 57	5 95	6 82	NA	6 30	6 05	NA	6 82	5.17	6 77
Specific Conductance (uS/cm)	Field	–	–	–	–	350 0	421 8	430 0	283 0	NA	342 0	401 0	385 0	347 0	341 0	300
Turbidity (NTU)	Field	–	–	–	–	0 4	0 8	4 1	120 0	NA	9	3	3 0	5.5	0 3	9 4
Dissolved Oxygen (mg/L)	Field	–	–	–	–	6 15	5 12	2 20	5 30	NA	4 90	0 1**	2 80	2 70	4 30	3 9
Temperature (°c)	Field	–	–	–	–	8 29	12.95	59 20	41 70	NA	50 7	59 3	58 70	48 00	54 00	55 8
Oxidation-Reduction Potential (mv)	Field	–	–	–	–	186	89	12	186	NA	78	113	111	129	54	73
VOCs																
Acetone	SW8260B	700 0	350 0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	NA	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA
Chlorobenzene	SW8260B	100 0	50 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,3,5-Trimethylbenzene	SW8260B	350 0	175 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2,4-Trimethylbenzene	SW8260B	350 0	175 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2-Dichlorobenzene	SW8260B	600 0	300 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
SVOCs																
(None Detected)	SW8270C	Not Applicable		--	--	ND	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides																
(None Detected)	SW8081A	Not Applicable		--	--	ND	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA
Dioxins																
Total 2,3,7,8-TCDD Equivalence	8290	3 0E-05	1.1E-05	–	–	0 0E+00	**4.9E-08**	**3.1E-08 JB**	0 0E+00	NA	0 0E+00	**3.0E-07 JBA**	0 0E+00	0 0E+00	NA	NA
Metals																
Aluminum	SW6010B	–	–	200	100	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	–	–	–	–	**56,500**	**60,000**	**58,200**	**51,800**	**52,200**	**54,000**	**59,900**	**57,600**	**60,000**	NA	NA
Chromium	SW6010B	100 0	50 0	--	--	ND< 10	ND< 10	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	**12.4**	ND< 10 0
Iron	SW6010B	–	--	300	150	ND< 100	ND< 100	ND< 100	**400**	ND< 100	**134**	ND< 100	ND< 100	ND< 100	NA	NA
Magnesium	SW6010B	--	--	--	–	**12,000**	**13,100**	**12,900**	**10,700**	**10,900**	**11,700**	**12,300**	**11,600**	**12,900**	NA	NA
Manganese	SW6010B	840	420	50	25	ND< 15	ND< 15	ND< 15	**44.3**	ND< 15	ND< 15 0	**15.7**	ND< 15	ND< 15	**29.2**	**104**
Potassium	SW6010B	–	--	–	–	**3,010**	**3,310**	**3,170**	ND< 2,500	ND< 2,500	**2,590**	**2,900**	**2,910**	**2,680**	NA	NA
Sodium	SW6010B	–	–	250,000	125,000	**23,700**	**23,500**	**23,800**	**19,600**	**19,900**	**16,500**	**18,900**	**20,200**	**20,200**	NA	NA
Zinc	SW6010B	–	--	5,000	2,500	ND< 20	ND< 20	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0
Arsenic	SW7060A	10.0	1 0	--	–	ND< 5	ND< 5	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5.00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00
Cyanide	E335 2	200 0	100 0	--	–	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods.
VOCS = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 16. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-107R)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-107R	MW-107R	MW-107R	MW-107R	MW-107R	MW-107R	MW-107R	MW-107R	MW-107R	MW-107R
Sample Collection Date:						3/28/2005	6/28/2005	9/18/2005	12/15/2005	4/19/2006	7/12/2006	9/22/2006	12/28/2006	6/20/2007	6/20/2008
Analyte	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary											
		VGES	PAL	VGES	PAL										
Initial Depth-to-Water Reading (FT BTOC)							5.27	5.78	3.27	3.64	3.24	4.44	2.55	4.67	4.61
Final Field Parameters															
pH (su)	Field	--	--	--	--	7.26	7.14	7.59	7.69	7.25	6.64	6.89	7.51	5.20	7.25
Specific Conductance (uS/cm)	Field	--	--	--	--	1174.0	1624.0	1516.0	NA	607.0	669.0	1,396	843	784	1208
Turbidity (NTU)	Field	--	--	--	--	1.9	6.3	3.2	6.5	4	2	7.6	9.9	1.4	0.7
Dissolved Oxygen (mg/L)	Field	--	--	--	--	4.35	0.40	5.50	1.90	1.60	0.1**	1.80	0.50	0.40	1.6
Temperature (°C)	Field	--	--	--	--	5.71	22.95	68.90	38.20	53.0	61.3	61.30	46.30	56.40	58.0
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-12	-46	-41	23	-22	-6	0	44	-30	-81
VOCs															
Acetone	SW8260B	700.0	350.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA
Chlorobenzene	SW8260B	100.0	50.0	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
1,3,5-Trimethylbenzene	SW8260B	350.0	175.0	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
1,2,4-Trimethylbenzene	SW8260B	350.0	175.0	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
1,2-Dichlorobenzene	SW8260B	600.0	300.0	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0	NA	NA
SVOCs															
Bis(2-ethylhexyl)phthalate	SW8270C	6.0	3.0	--	--	ND	ND	**16**	ND	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides															
(None Detected)	SW8081A	Not Applicable		--	--	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Dioxins															
Total 2,3,7,8-TCDD Equivalence	8290	3.0E-05	1.1E-05	--	--	0.0E+00	0.0E+00	**5.8E-08 JB**	**4.2E-08 J**	**2.6E-08 J**	**2.0E-07 JBA**	**2.9E-07 JB**	0.0E+00	NA	NA
Metals															
Aluminum	SW6010B	--	--	200	100	**232**	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	**196,000**	**337,000**	**342,000**	**157,000**	**133,000**	**141,000**	**333,000**	**191,000**	NA	NA
Chromium	SW6010B	100.0	50.0	--	--	ND< 10	ND< 10	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Iron	SW6010B	--	--	300	150	**854**	**904**	**730**	**253**	**209**	**295**	**897**	**284**	NA	NA
Magnesium	SW6010B	--	--	--	--	**35,100**	**59,900**	**62,300**	**26,700**	**25,100**	**25,600**	**57,500**	**34,400**	NA	NA
Manganese	SW6010B	840	420	50	25	**631**	**1,080**	**1,140**	**497**	**410**	**437**	**1,060**	**619**	**550**	**1,070**
Potassium	SW6010B	--	--	--	--	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**8,780**	**14,300**	**15,000**	**6,970**	**5,720**	**6,230**	**13,800**	**8,430**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	**24.8**	ND< 20	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	**9.6**	**8.52**	ND< 5.00	ND< 5.00	**5.18**	**6.34**	ND< 5.00	ND< 5.00	ND< 5.00	**17.7**
Cyanide	E335.2	200.0	100.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes.
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell. All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCS = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 17. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-107U)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-107U	MW-107U	MW-107U	MW-107U	MW-107U	MW-107U	MW-107U	MW-107U	MW-107U	MW-107U
Sample Collection Date:						3/28/2005	6/28/2005	9/18/2005	12/14/2005	4/19/2006	7/12/2006	9/22/2006	12/28/2006	6/20/2007	6/20/2008
Analyte	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary											
		VGES	PAL	VGES	PAL										
Initial Depth-to-Water Reading (FT BTOC)							17 19	17 60	15 89	16 05	15 90	16 51	15 24	16 74	16 60
Final Field Parameters															
pH (su)	Field	--	--	--	--	6.52	6 75	5 79	6 77	6 28	5 6**	NA	6 77	5 25	6 58
Specific Conductance (uS/cm)	Field	--	--	--	--	404 6	526 2	558 0	474 0	449 0	69 0	522 0	360.0	457 0	371
Turbidity (NTU)	Field	--	--	--	--	0.2	0 6	5 4	2 3	3	1	0 5	3 7	2 3	0 2
Dissolved Oxygen (mg/L)	Field	--	--	--	--	3 97	0 20	0 20	0 30	1 60	0 1**	0.90	0.50	0 40	2 2
Temperature (°C)	Field	--	--	--	--	5 37	14 28	64 70	49.40	53 3	60.8	64 50	49 90	60.00	52.9
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	197	-48	-28	155	81	144	80	177	31	51
VOCs															
Acetone	SW8260B	700 0	350 0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA
Chlorobenzene	SW8260B	100.0	50.0	--	--	ND< 2.0	ND< 2.0	ND< 2 0	**2.1**	ND< 2 0	ND< 2 0	ND< 2.0	ND< 2 0	NA	NA
1,3,5-Trimethylbenzene	SW8260B	350 0	175.0	--	--	*ND< 2.0*	*ND< 2 0*	*ND< 2.0*	*ND< 2.0*	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2,4-Trimethylbenzene	SW8260B	350.0	175.0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2.0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2-Dichlorobenzene	SW8260B	600.0	300 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2.0	NA	NA
SVOCs															
Bis(2-ethylhexyl)phthalate	SW8270C	6.0	3.0	--	--	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides															
(None Detected)	SW8081A	Not Applicable		--	--	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
Dioxins															
Total 2,3,7,8-TCDD Equivalence	8290	3 0E-05	1 1E-05	--	--	0 0E+00	0 0E+00	**2.7E-08 JB**	0 0E+00	0 0E+00	**4.5E-08 JBA**	**3.1E-05 JB**	0.0E+00	NA	NA
Metals															
Aluminum	SW6010B	--	--	200	100	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	**82,800**	**83,600**	**79,900**	**89,900**	**79,800**	**83,000**	**85,400**	**69,300**	NA	NA
Chromium	SW6010B	100.0	50 0	--	--	ND< 10	ND< 10	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10 0	ND< 10.0
Iron	SW6010B	--	--	300	150	ND< 100	**2,100**	**2,830**	ND< 100	**143**	**127**	**528**	ND< 100	NA	NA
Magnesium	SW6010B	--	--	--	--	**11,500**	**11,000**	**10,900**	**12,900**	**12,600**	**12,200**	**12,600**	**11,500**	NA	NA
Manganese	SW6010B	840	420	50	25	**519**	**4,790**	**5,000**	**2,620**	**590**	**1,390**	**3,620**	**359**	**2,290**	**924**
Potassium	SW6010B	--	--	--	--	**2,810**	**3,270**	**3,110**	ND< 2,500	ND< 2,500	**2,590**	**2,730**	ND< 2,500	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**25,000**	**26,600**	**25,100**	**18,100**	**16,900**	**14,100**	**15,500**	**11,300**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	**25.3**	ND< 20	ND< 20 0	ND< 20.0	ND< 20.0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20.0	ND< 20 0
Arsenic	SW7060A	10 0	1 0	--	--	ND< 5	ND< 5	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5.00	ND< 5 00	ND< 5.00
Mercury	SW7470A	2.0	0 5	--	--	*ND< 0 200*	*ND< 0.200*	*ND< 0 200*	*ND< 0 200*	*ND< 0 200*	*ND< 0 200*	ND< 0.200	**0.215**	NA	NA
Cyanide	E335 2	200 0	100.0	--	--	**10**	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes.
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCS = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 18. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-L-10)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-L-10	MW-L-10	MW-L-10	MW-L-10	MW-L-10	MW-L-10	MW-L-10	MW-L-10	MW-L-10	MW-L-10	MW-L-10
Sample Collection Date:						3/29/2005	6/29/2005	9/19/2005	9/19/2005	12/15/2005	4/19/2006	7/12/2006	9/23/2006	12/28/2006	6/20/2007	6/20/2008
Analyte	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary												
		VGES	PAL	VGES	PAL											
Initial Depth-to-Water Reading (FT BTOC)							9 76	10 98	--	7 73	8 40	8 15	9 53	8.32	8 90	9 02
Final Field Parameters																
pH (su)	Field	--	--	--	--	6 98	6 81	7 10	NA	7 16	6 63	6.30	6 84	7 09	5 12	6 94
Specific Conductance (uS/cm)	Field	--	--	--	--	254.2	712 0	606 0	NA	NA	788 0	NA	702 0	662 0	NA	643
Turbidity (NTU)	Field	--	--	--	--	7 7	10 0	18 4	NA	10.0	10	7	10 0	7 6	0 5	10 0
Dissolved Oxygen (mg/L)	Field	--	--	--	--	8.90	4 40	2 90	NA	3 60	5.30	0 1**	1.80	3 40	0 90	1 8
Temperature (°C)	Field	--	--	--	--	5 30	19 18	63 40	NA	41.90	54 3	58 7	59 40	49 40	57 20	57.7
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	173	74	-28	NA	191	97	104	10	146	19	73
VOCs																
Acetone	SW8260B	700.0	350.0	--	--	ND< 10	ND< 10	ND< 10	NA	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA
Chlorobenzene	SW8260B	100 0	50 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2.0	ND< 2 0	NA	NA
1,3,5-Trimethylbenzene	SW8260B	350 0	175 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2,4-Trimethylbenzene	SW8260B	350.0	175.0	--	--	ND< 2.0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2-Dichlorobenzene	SW8260B	600 0	300 0	--	--	ND< 2 0	ND< 2.0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
SVOCs																
Bis(2-ethylhexyl)phthalate	SW8270C	6 0	3.0	--	--	ND	ND	ND	NA	ND	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides																
Heptachlor	SW8081A	0 4	0 088	--	--	ND	ND	**0.0094**	NA	ND	ND	**0.015**	ND	ND	NA	NA
Dioxins																
Total 2,3,7,8-TCDD Equivalence	8290	3.0E-05	1 1E-05	--	--	0 0E+00	0.0E+00	**7.4E-07 JB1**	NA	**1.6E-06**	**2.7E-07 J**	**3.4E-08 JBA**	**6.1E-08 JB1**	0 0E+00	NA	NA
Metals																
Aluminum	SW6010B	--	--	200	100	ND< 200	ND< 200	233	ND< 200	ND< 200	ND< 200	ND< 200	203	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	**56,400**	**83,400**	**66,800**	**77,200**	**154,000**	**121,000**	**123,000**	**115,000**	**131,000**	NA	NA
Chromium	SW6010B	100 0	50 0	--	--	ND< 10	ND< 10	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0
Iron	SW6010B	--	--	300	150	**103**	304	665	ND< 100	ND< 100	ND< 100	**102**	952	**146**	NA	NA
Magnesium	SW6010B	--	--	--	--	**14,200**	**20,600**	**15,300**	**18,400**	**47,000**	**36,200**	**31,700**	**27,200**	**33,400**	NA	NA
Manganese	SW6010B	840	420	50	25	ND< 15	658	482	638	25.1	ND< 15 0	282	827	81.9	283	287
Potassium	SW6010B	--	--	--	--	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	ND< 2,500	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**8,640**	**20,700**	**22,300**	**23,700**	**61,900**	**39,000**	**18,100**	**29,800**	**18,000**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	ND< 20	ND< 20	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20 0
Arsenic	SW7060A	10 0	1 0	--	--	ND< 5	ND< 5	ND< 5 00	ND< 5 0	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00
Cyanide	E335 2	200 0	100 0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCS = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 19. SUMMARY OF GROUND WATER ANALYTICAL RESULTS (MW-L-11)

Pownal Tannery (Lagoon Area)
Pownal, Vermont

Sample ID:						MW-L-11	MW-L-11	MW-L-11	MW-L-11	MW-L-11	MW-L-11	MW-L-11	MW-L-11	MW-L-11	MW-L-11	MW-L-11
Sample Collection Date:						3/29/2005	6/29/2005	9/19/2005	12/15/2005	12/15/2005	4/19/2006	7/12/2006	9/23/2006	12/28/2006	6/20/2007	6/20/2008
Analyte	**Analytical Method**	**Ground Water Quality Standards**				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		**Secondary**												
		VGES	**PAL**	**VGES**	**PAL**											
Initial Depth-to-Water Reading (FT BTOC)							7 75	8 85	5 64	--	6 40	6 17	7 39	6 20	6 90	6 99
Final Field Parameters																
pH (su)	Field	--	--	--	--	6 64	6 74	5 05	6.89	NA	6 72	6 40	5 90	6 90	4 45	6 82
Specific Conductance (uS/cm)	Field	--	--	--	--	263 3	331 0	NA	318.0	NA	286 0	NA	388 0	307 0	279 0	247
Turbidity (NTU)	Field	--	--	--	--	*8 2*	*9 0*	*7 0*	62 0	NA	9	7	9 0	6 5	2 7	0 9
Dissolved Oxygen (mg/L)	Field	--	--	--	--	10 70	6 70	5 50	8 30	NA	7 80	0 25**	4 90	5.50	7 00	5 9
Temperature (°C)	Field	--	--	--	--	4 70	11 79	60 16	47 10	NA	48 0	57 4	59 90	47 60	53 30	53 5
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	216	109	-94	216	NA	139	19	106	232	79	179
VOCs																
Acetone	SW8260B	700 0	350 0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	NA	ND< 10	**12**	ND< 10	ND< 10	NA	NA
Chloromethane	SW8260B	30 0	15 0	--	--	ND< 5 0	ND< 5 0	ND< 5 0	ND< 5 0	NA	ND< 5 0	**1,000**	ND< 5 0	ND< 5 0	NA	NA
Chlorobenzene	SW8260B	100 0	50 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,3,5-Trimethylbenzene	SW8260B	350 0	175 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2,4-Trimethylbenzene	SW8260B	350 0	175 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
1,2-Dichlorobenzene	SW8260B	600 0	300 0	--	--	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	ND< 2 0	ND< 2 0	ND< 2 0	ND< 2 0	NA	NA
SVOCs																
Bis(2-ethylhexyl)phthalate	SW8270C	6 0	3 0	--	--	ND	ND	ND	ND< 12	NA	ND	ND	ND	ND	NA	NA
Organochlorine Pesticides																
Heptachlor	SW8081A	0 4	0 088	--	--	ND	ND	ND	ND	NA	ND	ND	ND	ND	NA	NA
Dioxins																
Total 2,3,7,8-TCDD Equivalence	8290	3 0E-05	1 1E-05	--	--	**2.8E-08**	0.0E+00	**6.6E-08 JB**	0 0E+00	NA	0 0E+00	**4.1E-08 JBA**	**3.3E-07 JB**	0 0E+00	NA	NA
Metals																
Aluminum	SW6010B	--	--	200	100	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	**48,500**	**49,700**	**55,000**	**56,000**	**55,900**	**49,700**	**54,400**	**58,200**	**52,200**	NA	NA
Chromium	SW6010B	100 0	50 0	--	--	ND< 10	ND< 10	ND< 10 0	ND< 10.0	ND< 10 0	ND< 10.0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0	ND< 10 0
Iron	SW6010B	--	--	300	150	**325**	**129**	ND< 100	**174**	ND< 100	**121**	**363**	**132**	**116**	NA	NA
Magnesium	SW6010B	--	--	--	--	**10,200**	**10,100**	**11,100**	**10,500**	**10,400**	**10,200**	**10,200**	**10,700**	**10,300**	NA	NA
Manganese	SW6010B	840	420	50	25	**16.4**	ND< 15	ND< 15.0	ND< 15 0	ND< 15 0	ND< 15 0	**20.8**	ND< 15 0	ND< 15 0	ND< 15 0	**26.9**
Potassium	SW6010B	--	--	--	--	**3,550**	**3,930**	**4,300**	**3,520**	**3,510**	**3,400**	**4,300**	**4,200**	**3,540**	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**17,300**	**16,800**	**22,500**	**18,100**	**18,000**	**13,400**	**20,900**	**20,300**	**18,700**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	ND< 20	ND< 20	ND< 20.0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20.0	ND< 20 0	ND< 20 0	ND< 20 0	ND< 20.0
Arsenic	SW7060A	10 0	1 0	--	--	ND< 5	ND< 5	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5 00	ND< 5.00	ND< 5 00
Cyanide	E335 2	200.0	100.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell All ground water samples collected by USEPA Region I Low Flow Purging and Sampling Methods
VOCS = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
Underlined values exceed one or more Ground Water Quality Standard

TABLE 20. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-L-7)
Lagoon Area - Upgradient

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-L-7	MW-L-7	MW-L-7	MW-L-7	MW-L-7
Sample Collection Date:						9/22/2005	9/22/2005	9/27/2006	6/27/2007	6/26/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary						
		VGES	PAL	VGES	PAL					
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	16.70	--	16.49	15.58	16.04
Final Field Parameters										
pH (su)	Field	--	--	--	--	8.09	NA	NA	7.36	7.03
Specific Conductance (uS/cm)	Field	--	--	--	--	742.0	NA	616.0	514.0	449.0
Turbidity (NTU)	Field	--	--	--	--	51.0	NA	10.0	4.0	8.9
Dissolved Oxygen (mg/L)	Field	--	--	--	--	7.80	NA	6.70	7.70	7.70
Temperature (°c)	Field	--	--	--	--	54.50	NA	56.30	59.30	55.60
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-13	NA	223	132	205
VOCs										
(None Detected)	SW8260B	Not Applicable				ND	NA	ND	ND	ND
SVOCs										
(None Detected)	SW8270C	Not Applicable				ND	NA	ND	NA	NA
Organochlorine Pesticides										
(None Detected)	SW8081A	Not Applicable				ND	NA	ND	NA	NA
Dioxins										
Total 2,3,7,8-TCDD Equivalence*	8290	3.0E-05	1.1E-05	--	--	0.0E+00	NA	0.0E+00	NA	NA
Metals										
Aluminum	SW6010B	--	--	200	100	**311**	ND< 200	**262**	NA	NA
Calcium	SW6010B	--	--	--	--	**86,400**	**84,900**	**82,400**	NA	NA
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10.0	ND< 10.0	ND< 10.0	**11.2**	ND< 10.0
Copper	SW6010B	--	--	1000	500	ND< 25.0	ND< 25.0	ND< 25.0	NA	NA
Iron	SW6010B	--	--	300	150	**459**	ND< 100	**301**	NA	NA
Lead	SW6010B	15.0	1.5	--	--	ND< 12.0	ND< 12.0	ND< 12.0	ND< 5.0	ND< 5.0
Magnesium	SW6010B	--	--	--	--	**20,000**	**19,600**	**13,800**	NA	NA
Manganese	SW6010B	840	420	50	25	**20.8**	ND< 15.0	ND< 15.0	**21.7**	ND< 15.0
Nickel	SW6010B	100.0	50.0	--	--	ND< 40.0	ND< 40.0	ND< 40.0	NA	NA
Potassium	SW6010B	--	--	--	--	**4,080**	**3,910**	**4,610**	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**73,700**	**73,600**	**63,400**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00
Cyanide	E335.2	200.0	100.0	--	--	ND< 10	ND< 10	ND< 10	NA	NA

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell. Ground water samples collected using USEPA Region I low flow purging and sampling
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
*Qualifiers are associated with the native isomers used to calculate the Total 2,3,7,8-TCDD Equivalence concentrations. One or more native isomer may be qualified, with one or more

NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard
J = Concentration detected is below the calibration range
A = Detection limit based on signal-to-noise measurement
B = Less than 10 times higher than method blank level

TABLE 21. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-L-8)
Lagoon Area - Upgradient

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-L-8	MW-L-8	MW-L-8	MW-L-8	MW-L-8	MW-L-8
Sample Collection Date:						9/23/2005	9/23/2005	9/28/2006	9/28/2006	6/28/2007	6/26/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary							
		VGES	PAL	VGES	PAL						
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	12.95	--	15.10	--	14.66	14.70
Final Field Parameters											
pH (su)	Field	--	--	--	--	8.52	NA	6.66	NA	7.69	7.78
Specific Conductance (uS/cm)	Field	--	--	--	--	385.0	NA	363.0	NA	377.0	353.0
Turbidity (NTU)	Field	--	--	--	--	423.0	NA	16.5	NA	10.3	9.0
Dissolved Oxygen (mg/L)	Field	--	--	--	--	3.40	NA	3.70	NA	1.60	5.00
Temperature (°C)	Field	--	--	--	--	63.30	NA	59.80	NA	62.30	59.90
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-39	NA	199	NA	120	133
VOCs											
(None Detected)	SW8260B	Not Applicable				ND	NA	ND	NA	ND	ND
SVOCs											
(None Detected)	SW8270C	Not Applicable				ND	NA	ND	NA	NA	NA
Organochlorine Pesticides											
(None Detected)	SW8081A	Not Applicable				ND	NA	ND	NA	NA	NA
Dioxins											
Total 2,3,7,8-TCDD Equivalence*	8290	3.0E-05	1.1E-05	--	--	**2.5E-07 B**	NA	0.0E+00	NA	NA	NA
Metals											
Aluminum	SW6010B	--	--	200	100	**21,000**	ND< 200	**691**	ND< 200	NA	NA
Calcium	SW6010B	--	--	--	--	**90,400**	**49,500**	**56,000**	**53,000**	NA	NA
Barium	SW6010B	2,000.0	1,000.0	--	--	**201**	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	**25.4**	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Copper	SW6010B	--	--	1000	500	**59.6**	ND< 25.0	ND< 25.0	ND< 25.0	NA	NA
Iron	SW6010B	--	--	300	150	**47,500**	**628**	**807**	ND< 100	NA	NA
Lead	SW6010B	15.0	1.5	--	--	**37.2**	ND< 12.0	ND< 12.0	ND< 12.0	ND< 5.0	ND< 5.0
Magnesium	SW6010B	--	--	--	--	**38,800**	**13,100**	**13,400**	**12,600**	NA	NA
Manganese	SW6010B	840	420	50	25	**1,960**	**456**	**599**	**484**	**184**	**163**
Nickel	SW6010B	100.0	50.0	--	--	**48.1**	ND< 40.0	ND< 40.0	ND< 40.0	NA	NA
Potassium	SW6010B	--	--	--	--	**4,400**	ND< 2,500	**2,500**	ND< 2,500	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**20,100**	**19,400**	**20,500**	**19,100**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	**153**	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	**21.0**	**10.0**	**5.8**	**5.6**	**6.3**	ND< 5.00
Cyanide	E335.2	200.0	100.0	--	--	ND< 10	ND< 10	ND< 10	ND< 10	NA	NA

Notes.
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell. Ground water samples collected using USEPA Region I low flow purging and sampling
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
*Qualifiers are associated with the native isomers used to calculate the Total 2,3,7,8-TCDD Equivalence concentrations. One or more native isomer may be qualified, with one or more

NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard
J = Concentration detected is below the calibration range
A = Detection limit based on signal-to-noise measurement
B = Less than 10 times higher than method blank level

TABLE 22. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-L-9)
Lagoon Area - Upgradient

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-L-9	MW-L-9	MW-L-9	MW-L-9	MW-L-9
Sample Collection Date:						9/22/2005	9/22/2005	9/27/2006	6/28/2007	6/20/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary						
		VGES	PAL	VGES	PAL					
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	15.35	--	14.16	16.65	13.48
Final Field Parameters										
pH (su)	Field	--	--	--	--	7.60	NA	NA	6.73	6.87
Specific Conductance (uS/cm)	Field	--	--	--	--	404.0	NA	358 0	308.0	261.0
Turbidity (NTU)	Field	--	--	--	--	327.0	NA	8 5	9.4	10.0
Dissolved Oxygen (mg/L)	Field	--	--	--	--	7.30	NA	8 40	7.40	6 2
Temperature (°C)	Field	--	--	--	--	65.80	NA	61.60	60.80	56.5
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-30	NA	240	130	184
VOCs										
(None Detected)	SW8260B	Not Applicable				ND	NA	ND	ND	ND
SVOCs										
(None Detected)	SW8270C	Not Applicable				ND	NA	ND	NA	NA
Organochlorine Pesticides										
(None Detected)	SW8081A	Not Applicable				ND	NA	ND	NA	NA
Dioxins										
Total 2,3,7,8-TCDD Equivalence*	8290	3.0E-05	1.1E-05	--	--	**8.2E-08 BJ**	NA	0.0E+00	NA	NA
Metals										
Aluminum	SW6010B	--	--	200	100	**3,330**	ND< 200	**218**	NA	NA
Calcium	SW6010B	--	--	--	--	**54,900**	**54,400**	**60,400**	NA	NA
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10 0	ND< 10.0	ND< 10 0	ND< 10.0	**11.6**
Copper	SW6010B	--	--	1000	500	ND< 25 0	ND< 25.0	ND< 25.0	NA	NA
Iron	SW6010B	--	--	300	150	**5,110**	**257**	**296**	NA	NA
Lead	SW6010B	15.0	1.5	--	--	ND< 12 0	ND< 12 0	ND< 12 0	ND< 5.0	ND< 5.0
Magnesium	SW6010B	--	--	--	--	**11,300**	**10,400**	**9,740**	NA	NA
Manganese	SW6010B	840	420	50	25	**266**	ND< 15.0	**22.3**	**60.8**	**45.8**
Nickel	SW6010B	100.0	50.0	--	--	ND< 40.0	ND< 40.0	ND< 40.0	NA	NA
Potassium	SW6010B	--	--	--	--	ND< 2,500	ND< 2,500	ND< 2,500	NA	NA
Sodium	SW6010B	--	--	250,000	125,000	**16,200**	**16,100**	**16,400**	NA	NA
Zinc	SW6010B	--	--	5,000	2,500	**39.2**	ND< 20.0	ND< 20.0	**20**	ND< 20 0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.0	ND< 5.00	ND< 5.00	ND< 5.00
Cyanide	E335.2	200 0	100.0	--	--	ND< 10	ND< 10	ND< 10	NA	NA

Notes:
All results reported in micrograms per liter, unless otherwise noted
Only detected analytes reported
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell. Ground water samples collected using USEPA Region I low flow purging and sampling
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
*Qualifiers are associated with the native isomers used to calculate the Total 2,3,7,8-TCDD Equivalence concentrations. One or more native isomer may be qualified, with one or more
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard
J = Concentration detected is below the calibration range
A = Detection limit based on signal-to-noise measurement
B = Less than 10 times higher than method blank level

TABLE 23. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(OF-1)
Mill Building and Woods Road Area

Pownal Tannery
Pownal, Vermont

Sample ID:						OF-1	OF-1	OF-1	OF-1
Sample Collection Date:						9/20/2005 (Unfiltered)	9/26/2006 (Unfiltered)	6/26/2007 (Unfiltered)	6/25/2008 (Unfiltered)
Parameter	**Analytical Method**	**Ground Water Quality Standards**							
		Primary		**Secondary**					
		VGES	**PAL**	**VGES**	**PAL**				
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	NA	--	--	--
Final Field Parameters									
pH (su)	Field	--	--	--	--	7.85	NA	NA	NA
Specific Conductance (uS/cm)	Field	--	--	--	--	606.0	NA	NA	NA
Turbidity (NTU)	Field	--	--	--	--	2.7	NA	NA	NA
Dissolved Oxygen (mg/L)	Field	--	--	--	--	7.10	NA	NA	NA
Temperature (°F)	Field	--	--	--	--	70.90	NA	NA	NA
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-62	NA	NA	NA
VOCs									
Isopropylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	ND	ND
tert-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	ND	ND
sec-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	ND	ND
SVOCs									
(None Detected)	SW8270C	(Not Applicable)				ND	ND	ND	ND
Metals (Target List)									
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200
Manganese	SW6010B	840	420	50	25	ND< 15.0	ND< 15.0	ND< 15.0	ND< 15.0
Zinc	SW6010B	--	--	5,000	2,500	ND< 20	**41.3**	**38.7**	**22.6**
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
EB = Equipment Blank
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 24. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-110U)
Mill Building and Woods Road Area

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-110U	MW-110U	MW-110U	MW-110U
Sample Collection Date:						9/20/2005 (Unfiltered)	9/26/2006 (Unfiltered)	6/26/2007 (Unfiltered)	6/25/2008 (Unfiltered)
Parameter	Analytical Method	Ground Water Quality Standards							
		Primary		Secondary					
		VGES	PAL	VGES	PAL				
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	10.33	9.89	10.00	8.82
Final Field Parameters									
pH (su)	Field	--	--	--	--	6.74	6.53	6.38	6.67
Specific Conductance (uS/cm)	Field	--	--	--	--	717.0	475.0	626.0	256
Turbidity (NTU)	Field	--	--	--	--	9.8	10.0	2.6	2.1
Dissolved Oxygen (mg/L)	Field	--	--	--	--	6.90	1.50	1.80	4.90
Temperature (°F)	Field	--	--	--	--	65.10	63.10	69.20	64.4
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-44	45	98	171
VOCs									
Isopropylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
tert-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
sec-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	ND< 2.0	ND< 2.0
SVOCs									
(None Detected)	SW8270C	(Not Applicable)				ND	ND	NA	NA
Metals (Target List)									
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200
Manganese	SW6010B	840	420	50	25	**519**	**156**	**33**	**41.3**
Zinc	SW6010B	--	--	5,000	2,500	ND< 20	**32.6**	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 25. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-113R)
Mill Building and Woods Road Area

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-113R	MW-113R	MW-113R	MW-113R	MW-113R	MW-113R
Sample Collection Date:						9/21/2005	9/21/2005	9/26/2006	9/26/2006	6/26/2007	6/25/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary							
		VGES	PAL	VGES	PAL						
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	8.76	--	6.92	--	7.96	6.95
Final Field Parameters											
pH (su)	Field	--	--	--	--	8.31	NA	5.26	--	7.00	7.25
Specific Conductance (uS/cm)	Field	--	--	--	--	670.0	NA	658.0	--	78.0	584
Turbidity (NTU)	Field	--	--	--	--	103.0	NA	42.0	--	15.0	10.2
Dissolved Oxygen (mg/L)	Field	--	--	--	--	0.70	NA	0.50	--	1.00	1.80
Temperature (°F)	Field	--	--	--	--	59.40	NA	62.40	--	79.50	59.70
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-31	NA	74	--	80	99
VOCs											
Isopropylbenzene	SW8260B	--	--	--	--	ND< 2.0	NA	ND< 2.0	NA	NA	NA
tert-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	NA	ND< 2.0	NA	NA	NA
sec-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	NA	ND< 2.0	NA	NA	NA
SVOCs											
(None Detected)	SW8270C	(Not Applicable)				ND	NA	ND	NA	NA	NA
Metals (Target List)											
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	**232**	**219**	**207**	ND< 200	**211**	ND< 200
Manganese	SW6010B	840	420	50	25	**1,310**	**1,190**	**1,130**	**841**	**975**	**740**
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	**138**	**35**	**42.8**	**5.4**	**43.5**	**13.5**

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 26. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-110R)
Mill Building and Woods Road Area

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-110R	MW-110R	MW-110R	MW-110R	MW-110R	MW-110R
Sample Collection Date:						9/21/2005	9/26/2006	9/26/2006	6/26/2007	6/25/2008	6/25/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Filtered)
		Primary		Secondary							
		VGES	PAL	VGES	PAL						
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	8.97	7.84	--	8.52	7.46	--
Final Field Parameters											
pH (su)	Field	--	--	--	--	8.90	7.04	--	7.35	7.53	--
Specific Conductance (uS/cm)	Field	--	--	--	--	918.0	857.0	--	1002	981	--
Turbidity (NTU)	Field	--	--	--	--	9.6	248.0	--	22.3	21.4	--
Dissolved Oxygen (mg/L)	Field	--	--	--	--	0.60	0.60	--	0.70	1.50	--
Temperature (°F)	Field	--	--	--	--	61.80	57.70	--	69.50	69.50	--
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-118	-115	--	-171	-168	--
VOCs											
Isopropylbenzene	SW8260B	--	--	--	--	**3.2**	ND< 2.0	NA	**7.9**	**6.0**	NA
n-Propylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	NA	**6.2**	**4.4**	NA
tert-Butylbenzene	SW8260B	--	--	--	--	**4.0**	**2.5**	NA	**4.2**	**4.1**	NA
sec-Butylbenzene	SW8260B	--	--	--	--	**2.3**	ND< 2.0	NA	**4.8**	**3.9**	NA
SVOCs											
(None Detected)	SW8270C	(Not Applicable)				ND	ND	ND	NA	NA	ND
Metals (Target List)											
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	**22.0**	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Manganese	SW6010B	840	420	50	25	**1,800**	**1,850**	**1,640**	**1,900**	**1,770**	**1,760**
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	**26.8**	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	**7.66**	**10.2**	**10**	**11.6**	**9.15**	**9.6**

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 27. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-106U)
Mill Building and Woods Road Area

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-106U	MW-106U	MW-106U	MW-106U
Sample Collection Date:						9/21/2005 (Unfiltered)	9/26/2006 (Unfiltered)	6/26/2007 (Unfiltered)	6/25/2008 (Unfiltered)
Parameter	Analytical Method	Ground Water Quality Standards							
		Primary		Secondary					
		VGES	PAL	VGES	PAL				
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	15.05	14.43	14.71	14.19
Final Field Parameters									
pH (su)	Field	--	--	--	--	8.38	NA	6.35	6.86
Specific Conductance (uS/cm)	Field	--	--	--	--	369.0	583.0	488.0	534
Turbidity (NTU)	Field	--	--	--	--	2.2	10.0	0.9	1.1
Dissolved Oxygen (mg/L)	Field	--	--	--	--	1.10	1.40	9.00	4.70
Temperature (°F)	Field	--	--	--	--	55.10	56.40	54.30	50.00
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	1	139	82	120
VOCs									
Isopropylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	NA	NA
tert-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	NA	NA
sec-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	ND< 2.0	NA	NA
SVOCs									
(None Detected)	SW8270C	(Not Applicable)				ND	ND	NA	NA
Metals (Target List)									
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200
Manganese	SW6010B	840	420	50	25	**29.4**	**17.1**	ND< 15.0	**25.6**
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 28. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-112U)
Mill Building and Woods Road Area

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-112U	MW-112U	MW-112U	MW-112U
Sample Collection Date:						9/21/2005 (Unfiltered)	9/21/2005 (Filtered)	6/26/2007 (Unfiltered)	6/25/2008 (Unfiltered)
Parameter	Analytical Method	Ground Water Quality Standards							
		Primary		Secondary					
		VGES	PAL	VGES	PAL				
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	9.48	--	9.65	8.26
Final Field Parameters									
pH (su)	Field	--	--	--	--	8.01	NA	6.56	6.92
Specific Conductance (uS/cm)	Field	--	--	--	--	197.0	NA	NA	154
Turbidity (NTU)	Field	--	--	--	--	82.0	NA	9.5	8.9
Dissolved Oxygen (mg/L)	Field	--	--	--	--	7.80	NA	0.90	3.10
Temperature (°F)	Field	--	--	--	--	62.80	NA	56.30	57.80
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-1	NA	75	118
VOCs									
Isopropylbenzene	SW8260B	--	--	--	--	ND< 2.0	NA	NA	NA
tert-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	NA	NA	NA
sec-Butylbenzene	SW8260B	--	--	--	--	ND< 2.0	NA	NA	NA
SVOCs									
(None Detected)	SW8270C	(Not Applicable)				ND	NA	NA	NA
Metals (Target List)									
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200
Manganese	SW6010B	840	420	50	25	**63.4**	ND< 15.0	**80.7**	**168**
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 29. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-101U)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-101U	MW-101U	MW-101U	MW-101U	MW-101U	MW-101U	MW-101U
Sample Collection Date:						9/21/2005	9/21/2005	9/26/2006	9/26/2006	6/27/2007	6/25/2008	6/25/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Filtered)
		Primary		Secondary								
		VGES	PAL	VGES	PAL							
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	16.70	--	15.45	--	15.65	15.90	--
Final Field Parameters												
pH (su)	Field	--	--	--	--	8.75	NA	NA	--	6.69	7.10	--
Specific Conductance (uS/cm)	Field	--	--	--	--	481.0	NA	642.0	--	687.0	535	--
Turbidity (NTU)	Field	--	--	--	--	783.0	NA	165.0	--	42.3	18.0	--
Dissolved Oxygen (mg/L)	Field	--	--	--	--	2.10	NA	1.50	--	1.90	1.8	--
Temperature (°F)	Field	--	--	--	--	65.47	NA	61.90	--	71.10	66.70	--
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-37	NA	144	--	85	119	--
VOCs												
(None Detected)	SW8260B	Not Applicable				ND	NA	ND	NA	NA	NA	NA
SVOCs												
(None Detected)	SW8270C	Not Applicable				ND	NA	ND	NA	NA	NA	NA
Metals (Target List)												
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	**25.3**	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	**66.5**	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	**19.6**	ND< 5.0	**12.3**	ND< 5.0	ND< 5.0	ND< 5.0	ND< 5.0
Manganese	SW6010B	840	420	50	25	**3,590**	**70.6**	**10,800**	**18.1**	**4,960**	**1,580**	**60.7**
Zinc	SW6010B	--	--	5,000	2,500	**97.1**	ND< 20	ND< 20	**51.2**	ND< 20	ND< 20	ND< 20
Arsenic	SW7060A	10.0	1.0	--	--	**6.56**	ND< 5.0	ND< 5.00	ND< 5.0	ND< 5.00	ND< 5.00	ND< 5.0

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 30. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-103U)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-103U	MW-103U	MW-103U	MW-103U
Sample Collection Date:						9/21/2005	9/26/2006	6/27/2007	6/25/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary					
		VGES	PAL	VGES	PAL				
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	22.70	20.62	20.48	20.56
Final Field Parameters									
pH (su)	Field	--	--	--	--	9.35	NA	6.97	7.84
Specific Conductance (uS/cm)	Field	--	--	--	--	291.0	269.0	255.0	288
Turbidity (NTU)	Field	--	--	--	--	6.3	10.0	4.4	10.0
Dissolved Oxygen (mg/L)	Field	--	--	--	--	8.40	7.90	8.40	5.9
Temperature (°F)	Field	--	--	--	--	59.19	54.90	55.80	66.80
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-19	159	91	122
VOCs									
(None Detected)	SW8260B	Not Applicable				ND	ND	NA	NA
SVOCs									
(None Detected)	SW8270C	Not Applicable				ND	ND	NA	NA
Metals (Target List)									
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	ND< 12.0	ND< 12.0	ND< 5.0	ND< 5.0
Manganese	SW6010B	840	420	50	25	**32.5**	**19.4**	ND< 15.0	**17.1**
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 31. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-103R)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-103R	MW-103R	MW-103R	MW-103R	MW-103R	MW-103R
Sample Collection Date:						9/21/2005	9/21/2005	9/27/2006	9/27/2006	6/27/2007	6/26/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary							
		VGES	PAL	VGES	PAL						
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	44.00	--	43.29	--	43.29	43.18
Final Field Parameters											
pH (su)	Field	--	--	--	--	9.89	NA	7.96	--	7.31	8.10
Specific Conductance (uS/cm)	Field	--	--	--	--	168.0	NA	158.0	--	192.0	172
Turbidity (NTU)	Field	--	--	--	--	111.0	NA	342.0	--	22.3	10.2
Dissolved Oxygen (mg/L)	Field	--	--	--	--	1.60	NA	1.00	--	0.20	2.0
Temperature (°F)	Field	--	--	--	--	51.70	NA	50.20	--	60.70	50.40
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-132	NA	-87	--	-169	-171
VOCs											
(None Detected)	SW8260B	Not Applicable				ND	NA	ND	NA	NA	NA
SVOCs											
(None Detected)	SW8270C	Not Applicable				ND	NA	ND	NA	NA	NA
Metals (Target List)											
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	ND< 12.0	ND< 12.0	ND< 12.0	ND< 12.0	ND< 5.0	ND< 5.0
Manganese	SW6010B	840	420	50	25	**246**	**177**	**265**	**167**	**225**	**221**
Zinc	SW6010B	--	--	5,000	2,500	**21.4**	ND< 20.0	**26.2**	ND< 20.0	ND< 20.0	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	**5.04**	ND< 5.0	**8.89**	**7.8**	**9.71**	**8.46**

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 32. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-B-8)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-B-8	MW-B-8	MW-B-8	MW-B-8	MW-B-8
Sample Collection Date:						9/22/2005	9/27/2006	6/27/2007	6/26/2008	6/26/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Filtered)
		Primary		Secondary						
		VGES	PAL	VGES	PAL					
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	11.37	11.06	10.44	10.84	--
Final Field Parameters										
pH (su)	Field	--	--	--	--	7.76	7.09	7.69	7.55	--
Specific Conductance (uS/cm)	Field	--	--	--	--	314.0	318.0	314.0	257	--
Turbidity (NTU)	Field	--	--	--	--	9.9	9.0	0.3	97.3	--
Dissolved Oxygen (mg/L)	Field	--	--	--	--	5.30	3.80	3.20	4.9	--
Temperature (°F)	Field	--	--	--	--	57.90	57.90	54.20	51.80	--
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	40	75	71	56	--
VOCs										
(None Detected)	SW8260B	Not Applicable				ND	ND	NA	NA	NA
SVOCs										
(None Detected)	SW8270C	Not Applicable				ND	ND	NA	NA	NA
Metals (Target List)										
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	ND< 12.0	ND< 12.0	ND< 5.0	ND< 5.0	ND< 5.0
Manganese	SW6010B	840	420	50	25	**53.4**	**46.4**	**37.9**	**324**	ND< 15.0
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	**33.7**	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 33. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-B-7)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-B-7	MW-B-7	MW-B-7	MW-B-7
Sample Collection Date:						9/22/2005	9/27/2006	6/27/2007	6/26/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary					
		VGES	PAL	VGES	PAL				
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	5.90	5.62	5.72	5.51
Final Field Parameters									
pH (su)	Field	--	--	--	--	7.92	6.80	7.44	7.26
Specific Conductance (uS/cm)	Field	--	--	--	--	390.0	357.0	320.0	311
Turbidity (NTU)	Field	--	--	--	--	10.0	1.8	1.7	9.1
Dissolved Oxygen (mg/L)	Field	--	--	--	--	0.70	0.90	8.30	2.2
Temperature (°F)	Field	--	--	--	--	63.90	59.00	62.40	57.90
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	5	119	80	92
VOCs									
(None Detected)	SW8260B	Not Applicable				ND	ND	NA	NA
SVOCs									
(None Detected)	SW8270C	Not Applicable				ND	ND	NA	NA
Metals (Target List)									
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	ND< 12.0	ND< 12.0	ND< 5.0	ND< 5.0
Manganese	SW6010B	840	420	50	25	**317**	**358**	**455**	**2,990**
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	**90.8**
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 34. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-102U)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-102U	MW-102U	MW-102U	MW-102U	MW-102U	MW-102U
Sample Collection Date:						9/22/2005	9/22/2005	9/27/2006	6/27/2007	6/26/2008	6/26/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Unfiltered)	(Filtered)
		Primary		Secondary							
		VGES	PAL	VGES	PAL						
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	26.20	--	26.12	26.08	26.05	--
Final Field Parameters											
pH (su)	Field	--	--	--	--	7.93	NA	4.19	7.66	NA	--
Specific Conductance (uS/cm)	Field	--	--	--	--	370.0	NA	272.0	215.0	NA	--
Turbidity (NTU)	Field	--	--	--	--	13.1	NA	9.0	47.0	NA	--
Dissolved Oxygen (mg/L)	Field	--	--	--	--	4.90	NA	4.90	6.60	NA	--
Temperature (°F)	Field	--	--	--	--	67.40	NA	63.10	61.70	NA	--
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	-40	NA	63	107	NA	--
VOCs											
(None Detected)	SW8260B	Not Applicable				ND	NA	ND	NA	NA	NA
SVOCs											
(None Detected)	SW8270C	Not Applicable				ND	NA	ND	NA	NA	NA
Metals (Target List)											
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0	**11.2**	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	ND< 12.0	ND< 12.0	ND< 12.0	ND< 5.0	ND< 5.0	ND< 5.0
Manganese	SW6010B	840	420	50	25	**17.4**	ND< 15.0	ND< 15.0	**248**	**782**	ND< 15.0
Zinc	SW6010B	--	--	5,000	2,500	ND< 20.0	ND< 20.0	ND< 20.0	**33.3**	**120**	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.0	ND< 5.00	ND< 5.00	**6.10**	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
Field parameters analyzed using an Insitu Troll 9000 multi-parameter meter with a flow-through cell.
Ground water samples collected using USEPA Region I low flow purging and sampling protocol.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 35. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(MW-B-10)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						MW-B-10	MW-B-10	MW-B-10	MW-B-10	MW-B-10	MW-B-10	MW-B-10
Sample Collection Date:						9/22/2005	9/22/2005	9/27/2006	9/27/2006	6/27/2007	6/26/2008	6/26/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Filtered)	(Unfiltered)	(Filtered)	(Unfiltered)	(Unfiltered)	(Filtered)
		Primary		Secondary								
		VGES	PAL	VGES	PAL							
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	23.17	--	22.80	--	22.82	22.81	--
Final Field Parameters												
pH (su)	Field	--	--	--	--	NA	NA	--	--	NA	NA	--
Specific Conductance (uS/cm)	Field	--	--	--	--	NA	NA	--	--	NA	NA	--
Turbidity (NTU)	Field	--	--	--	--	NA	NA	--	--	NA	NA	--
Dissolved Oxygen (mg/L)	Field	--	--	--	--	NA	NA	--	--	NA	NA	--
Temperature (°F)	Field	--	--	--	--	NA	NA	--	--	NA	NA	--
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	NA	NA	--	--	NA	NA	--
VOCs												
(None Detected)	SW8260B	Not Applicable				ND	NA	ND	NA	NA	NA	NA
SVOCs												
(None Detected)	SW8270C	Not Applicable				ND	NA	ND	NA	NA	NA	NA
Metals (Target List)												
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	**28.5**	ND< 20.0	ND< 20.0	ND< 400	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	**243**	ND< 200	ND< 200	ND< 200	**306**	ND< 4,000	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	**32.9**	ND< 10.0	**27.3**	ND< 10.0	**75.2**	ND< 200	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	**55.6**	ND< 12.0	**37.7**	ND< 12.0	ND< 20	**696**	ND< 5.0
Manganese	SW6010B	840	420	50	25	**5,130**	ND< 15.0	**2,100**	**360**	**6,220**	**82,800**	ND< 15.0
Zinc	SW6010B	--	--	5,000	2,500	**276**	ND< 20.0	**196**	ND< 20.0	**481**	**2,430**	ND< 20.0
Arsenic	SW7060A	10.0	1.0	--	--	**13.8**	ND< 5.00	**7.62**	ND< 5.0	**29.3**	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

TABLE 36. SUMMARY OF GROUND WATER ANALYTICAL RESULTS
(Leachate)
Dean Road Landfill

Pownal Tannery
Pownal, Vermont

Sample ID:						Leachate	Leachate	Leachate	Leachate
Sample Collection Date:						9/22/2005	9/28/2006	6/27/2007	6/25/2008
Parameter	Analytical Method	Ground Water Quality Standards				(Unfiltered)	(Unfiltered)	(Unfiltered)	(Unfiltered)
		Primary		Secondary					
		VGES	PAL	VGES	PAL				
Initial Depth-to-Water Reading (FT BTOC)	Field	--	--	--	--	--	--	NA	--
Final Field Parameters									
pH (su)	Field	--	--	--	--	NA	NA	NA	NA
Specific Conductance (uS/cm)	Field	--	--	--	--	NA	NA	NA	NA
Turbidity (NTU)	Field	--	--	--	--	NA	NA	NA	NA
Dissolved Oxygen (mg/L)	Field	--	--	--	--	NA	NA	NA	NA
Temperature (°F)	Field	--	--	--	--	NA	NA	NA	NA
Oxidation-Reduction Potential (mv)	Field	--	--	--	--	NA	NA	NA	NA
VOCs									
(None Detected)	SW8260B	Not Applicable				ND	ND	ND	ND
SVOCs									
(None Detected)	SW8270C	Not Applicable				ND	ND	ND	ND
Metals (Target List)									
Antimony	SW6010B	6.0	3.0	--	--	ND< 20.0	ND< 20.0	ND< 20.0	ND< 20.0
Barium	SW6010B	2,000.0	1,000.0	--	--	ND< 200	240	ND< 200	ND< 200
Chromium	SW6010B	100.0	50.0	--	--	ND< 10.0	ND< 10.0	ND< 10.0	ND< 10.0
Lead	SW6010B	15.0	1.5	--	--	**147**	**57.6**	**60**	**23**
Manganese	SW6010B	840	420	50	25	**362**	**1,050**	**634**	**327**
Zinc	SW6010B	--	--	5,000	2,500	**12,100**	**5,270**	**16,700**	**1,320**
Arsenic	SW7060A	10.0	1.0	--	--	ND< 5.00	ND< 5.00	ND< 5.00	ND< 5.00

Notes:
All results reported in micrograms per liter, unless otherwise noted.
Only detected analytes reported.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
VGES = Vermont Ground Water Enforcement Standard
PAL = Preventive Action Level
NS = Not Sampled
NA = Not Analyzed
ND = None Detected above detection limits
FT BTOC = Feet below top of casing
Underlined values exceed one or more Ground Water Quality Standard

Sediment Data

TABLE 7. SUMMARY OF SEDIMENT ANALYTICAL RESULTS

Pownal Tannery
Pownal, Vermont

Sample ID:						SD-37	SD-36	SD-34	SD-31	SD-30
Sample Collection Date:						9/23/2005	9/23/2005	9/23/2005	9/23/2005	9/23/2005
Analyte	Analytical Method	Units	Sediment Quality Guidelines[a] (SQGs)							
			NEL	LEL	SEL					
VOCs										
cis-1,2-Dichloroethene	SW8260	µg/Kg	--	--	--	ND< 42	ND< 33	ND< 47	ND< 41	47
SVOCs										
Fluoranthene	SW8270C	µg/Kg	--	750	1,020,000	ND< 340	ND< 330	520	440	370
Pyrene	SW8270C	µg/Kg	--	490	850,000	ND< 340	ND< 330	470	400	ND< 330
Benzo(b)fluoranthene	SW8270C	µg/Kg	--	--	--	ND< 340	ND< 330	ND< 420	ND< 330	ND< 330
Organochlorine Pesticides										
Dieldrin	SW8081A	µg/Kg	0.6	2	19,000	ND< 2.2	2.2	ND< 2.7	ND< 2.2	ND< 2.2
4,4'DDT	SW8081A	µg/Kg	--	7[b]	6,000[b]	2.8	2.6	5.9	ND< 2.2	ND< 2.2
Polychlorinated Biphenyls										
(None Detected)	680	µg/Kg	(Not Applicable)			ND	ND	ND	ND	ND
Total Organic Carbon										
	Lloyd Kahn	mg/Kg	--	10,000	100,000	3,200	3,500	8,900	2,500	1,900
Dioxins										
Total 2,3,7,8-TCDD Equivalence*	8290	ng/Kg	--	--	--	0.21 JAB	0.14 JABI	0.45 J	0.22 JAB	0.21 JABI
Metals (Full List)										
Aluminum	SW6010B	mg/Kg	--	--	--	7,340	7,140	8,400	4,890	4,030
Barium	SW6010B	mg/Kg	--	--	--	ND< 26.2	ND< 25.8	50.6	ND< 26.8	ND< 25.5
Calcium	SW6010B	mg/Kg	--	--	--	4,950	4,950	8,840	4,650	4,520
Chromium	SW6010B	mg/Kg	--	26	110	13.6	13.2	27.1	10.3	18.8
Cobalt	SW6010B	mg/Kg	--	--	--	7.99	7.30	8.27	ND< 6.70	ND< 6.38
Copper	SW6010B	mg/Kg	--	16	110	13.1	10.1	18.5	8.91	8.97
Iron	SW6010B	mg/Kg	--	20,000	40,000	20,600	20,300	21,200	14,600	13,000
Lead	SW6010B	mg/Kg	--	31	250	14.5	12.0	22.1	11.1	15.4
Magnesium	SW6010B	mg/Kg	--	--	--	5,860	6,070	7,680	4,840	3,340
Manganese	SW6010B	mg/Kg	--	460	1,100	282	305	529	181	264
Nickel	SW6010B	mg/Kg	--	16	75	15.5	15.4	15.3	11.2	9.55
Potassium	SW6010B	mg/Kg	--	--	--	538	408	1,280	479	ND< 319
Selenium	SW6010B	mg/Kg	--	--	--	16.1	ND< 15.5	ND< 19.0	ND< 16.1	ND< 15.3
Vanadium	SW6010B	mg/Kg	--	--	--	9.42	9.04	12.70	ND< 6.70	ND< 6.38
Zinc	SW6010B	mg/Kg	--	120	820	77.6	75.2	90.9	61.7	54.3
Mercury	SW7471A	mg/Kg	--	--	--	ND< 0.0666	0.0824	ND< 0.0818	ND< 0.0669	ND< 0.0626

Notes:

Only detected analytes reported

VOCs = Volatile Organic Compounds

SVOCs = Semi-Volatile Organic Compounds

NA = Not Analyzed

ND = Indicates compound was analyzed for, but not detected at or above the reporting limit.

J = Concentration detected is below the calibration range

A = Detection limit based on signal-to-noise measurement

B = Less than 10 times higher than method blank level

I = Interference

*Qualifiers are associated with the native isomers used to calculate the Total 2,3,7,8-TCDD Equivalence concentrations. One or more native isomer may be qualified, with one or more qualifier. See laboratory report for details.

[a] Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario (1993)

[b] Guideline is for DDT (total)

NEL = No Effects Level

LEL = Lowest Effects Level

SEL = Severe Effects Level

Underlined values exceed either the NEL, LEL, or SEL of the SQG.

TABLE 8. SUMMARY OF QA/QC RESULTS

Sediment Sampling

Pownal Tannery,
North Pownal, Vermont

Sample ID:			SD-31	Dup (SD-31)	EB	TB
Sample Collection Date:			9/23/2005	9/23/2005	9/23/2005	9/23/2005
Analyte	**Analytical Method**	**Units**				
VOCs						
cis-1,2-Dichloroethene	SW8260	ppb	ND< 41	ND< 40	ND	ND< 25
SVOCs						
Fluoranthene	SW8270C	ppb	440	590	ND	NA
Pyrene	SW8270C	ppb	400	570	ND	NA
Benzo(b)fluoranthene	SW8270C	ppb	ND< 330	400	ND	NA
Organochlorine Pesticides						
Dieldrin	SW8081A	ppb	ND< 2.2	ND< 2.4	ND	NA
4,4'-DDT	SW8081A	ppb	ND< 2.2	2.6	ND	NA
Polychlorinated Biphenyls						
(None Detected)	680	ppb	ND	ND	ND	NA
Total Organic Carbon						
	Lloyd Kahn	ppm	2,500	NA	NA	NA
Dioxins						
Total 2,3,7,8-TCDD Equivalence*	8290	ppt	0.22 JAB	0.40 J	3.7E-08 JB	NA
Metals (Full List)						
Aluminum	SW6010B	ppm	4,890	7,130	ND	NA
Barium	SW6010B	ppm	ND< 26.8	ND< 29.7	ND	NA
Calcium	SW6010B	ppm	4,650	5,820	ND	NA
Chromium	SW6010B	ppm	10.3	12.9	ND	NA
Cobalt	SW6010B	ppm	ND< 6.70	7.66	ND	NA
Copper	SW6010B	ppm	8.9	10.2	ND	NA
Iron	SW6010B	ppm	14,600	19,000	ND	NA
Lead	SW6010B	ppm	11.1	21.8	ND	NA
Magnesium	SW6010B	ppm	4,840	6,420	ND	NA
Manganese	SW6010B	ppm	181	240	ND	NA
Nickel	SW6010B	ppm	11.2	15.4	ND	NA
Potassium	SW6010B	ppm	479	673	ND	NA
Selenium	SW6010B	ppm	ND< 16.1	19.5	ND	NA
Vanadium	SW6010B	ppm	ND< 6.70	9.45	ND	NA
Zinc	SW6010B	ppm	61.7	79.2	ND	NA
Mercury	SW7471A	ppm	ND< 0.0669	ND< 0.0718	ND	NA

Notes
Only detected analytes reported
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
NA = Not Analyzed
ND = Indicates compound was analyzed for, but not detected at or above the reporting limit
J = Concentration detected is below the calibration range
A = Detection limit based on signal-to-noise measurement
B = Less than 10 times higher than method blank level
I = Interference

ppb = parts per billion
ppm = parts per million
ppt = parts per trillion

*Qualifiers are associated with the native isomers used to calculate the Total 2,3,7,8-TCDD Equivalence concentrations. One or more native isomer may be qualified, with one or more qualifier. See laboratory report for details.

TABLE 8. SUMMARY OF QA/QC RESULTS

Sediment Sampling

Pownal Tannery,
North Pownal, Vermont

Sample ID:			SD-31	Dup (SD-31)	EB	TB
Sample Collection Date:			9/23/2005	9/23/2005	9/23/2005	9/23/2005
Analyte	Analytical Method	Units				
VOCs						
Toluene	SW8260	ppb	**410**	**420**	ND	ND< 25
SVOCs						
4-Methylphenol	SW8270C	ppb	**710**	**2,500**	ND	NA
Phenanthrene	SW8270C	ppb	ND< 600	**850**	ND	NA
Fluoranthene	SW8270C	ppb	**900**	**1,900**	ND	NA
Pyrene	SW8270C	ppb	**860**	**1,800**	ND	NA
Benz(a)anthracene	SW8270C	ppb	ND< 600	**1,000**	ND	NA
Chrysene	SW8270C	ppb	ND< 600	**1,000**	ND	NA
Benzo(a)pyrene	SW8270C	ppb	ND< 600	**940**	ND	NA
Benzo(b)fluoranthene	SW8270C	ppb	ND< 600	**750**	ND	NA
Benzo(k)fluoranthene	SW8270C	ppb	ND< 600	**770**	ND	NA
Organochlorine Pesticides						
gamma-Chlordane	SW8081A	ppb	**10**	ND< 9.9	ND	NA
Polychlorinated Biphenyls						
Pentachlorobiphenyl	680	ppb	**26**	ND< 12	ND	NA
Tetrachlorobiphenyl	680	ppb	**21**	ND< 12	ND	NA
Total Organic Carbon						
	Lloyd Kahn	ppm	**26,000**	NA	NA	NA
Dioxins						
Total 2,3,7,8-TCDD Equivalence*	8290	ppt	**2.9 JAI**	**2.60 JA**	0.00	NA
Metals (Full List)						
Aluminum	SW6010B	ppm	**14,200**	**12,000**	ND	NA
Antimony	SW6010B	ppm	**15.2**	**13.3**	ND	NA
Arsenic	SW6010B	ppm	ND< 5.85	ND< 5.89	ND	NA
Barium	SW6010B	ppm	**78.6**	**74.9**	ND	NA
Calcium	SW6010B	ppm	**14,300**	**14,200**	ND	NA
Chromium	SW6010B	ppm	**29.6**	**30.7**	ND	NA
Cobalt	SW6010B	ppm	ND< 14.6	ND< 14.7	ND	NA
Copper	SW6010B	ppm	**32.4**	**35.3**	ND	NA
Iron	SW6010B	ppm	**28,000**	**26,100**	ND	NA
Lead	SW6010B	ppm	**40.5**	**37.9**	ND	NA
Magnesium	SW6010B	ppm	**9,890**	**8,960**	ND	NA
Manganese	SW6010B	ppm	**1,010**	**988**	**0.0183**	NA
Nickel	SW6010B	ppm	**22.1**	**20.3**	ND	NA
Potassium	SW6010B	ppm	**1,770**	**1,480**	ND	NA
Selenium	SW6010B	ppm	ND< 5.8	ND< 5.9	ND	NA
Vanadium	SW6010B	ppm	**19.2**	**16.90**	ND	NA
Zinc	SW6010B	ppm	**138**	**126.0**	**0.0245**	NA
Mercury	SW7471A	ppm	**0.134**	ND< 0.169	ND	NA

Notes:
Only detected analytes reported.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
NA = Not Analyzed
ND = Indicates compound was analyzed for, but not detected at or above the reporting limit.
J = Concentration detected is below the calibration range
A = Detection limit based on signal-to-noise measurement
B = Less than 10 times higher than method blank level
I = Interference

ppb = parts per billion
ppm = parts per million
ppt = parts per trillion

*Qualifiers are associated with the native isomers used to calculate the Total 2,3,7,8-TCDD Equivalence concentrations. One or more native isomer may be qualified, with one or more qualifier. See laboratory report for details.

TABLE 7. SUMMARY OF SEDIMENT ANALYTICAL RESULTS

Pownal Tannery
Pownal, Vermont

Sample ID:						SD-37	SD-36	SD-34	SD-31	SD-30
Sample Collection Date:						9/28/2006	9/28/2006	9/28/2006	9/28/2006	9/28/2006
Analyte	Analytical Method	Units	Sediment Quality Guidelines[a] (SQGs)							
			NEL	LEL	SEL					
VOCs										
Toluene	SW8260	µg/Kg	--	--	--	ND< 39	ND< 65	ND< 50	410	ND< 44
SVOCs										
4-Methylphenol	SW8270C	µg/Kg	--	--	--	ND< 410	ND< 370	ND< 380	710	ND< 310
Phenanthrene	SW8270C	µg/Kg	--	560	950,000	700	450	ND< 380	ND< 600	ND< 310
Fluoranthene	SW8270C	µg/Kg	--	750	1,020,000	1,000	710	ND< 380	900	ND< 310
Pyrene	SW8270C	µg/Kg	--	490	850,000	1,000	650	ND< 380	860	ND< 310
Benz(a)anthracene	SW8270C	µg/Kg	--	320	1,480,000	550	ND< 370	ND< 380	ND< 600	ND< 310
Chrysene	SW8270C	µg/Kg	--	340	460,000	570	ND< 370	ND< 380	ND< 600	ND< 310
Benzo(a)pyrene	SW8270C	µg/Kg	--	370	1,440,000	480	ND< 370	ND< 380	ND< 600	ND< 310
Benzo(b)fluoranthene	SW8270C	µg/Kg	--	--	--	440	ND< 370	ND< 380	ND< 600	ND< 310
Organochlorine Pesticides										
gamma-Chlordane	SW8081A	µg/Kg	5	3	7,000	ND< 6.4	ND< 6.0	ND< 6.0	10	ND< 5.0
Polychlorinated Biphenyls										
Pentachlorobiphenyl	680	µg/Kg	--	--	--	ND< 9.7	ND< 9.7	ND< 13	26	ND< 8.6
Tetrachlorobiphenyl	680	µg/Kg	--	--	--	ND< 9.7	ND< 9.7	ND< 13	21	ND< 8.6
Total Organic Carbon										
	Lloyd Kahn	mg/Kg	--	10,000	100,000	11,000	4,800	16,000	26,000	2,800
Dioxins										
Total 2,3,7,8-TCDD Equivalence*	8290	ng/Kg	--	--	--	0.79 JA1	0.49 JA1	12 JA	2.9 JAI	1.0 JAI
Metals (Full List)										
Aluminum	SW6010B	mg/Kg	--	--	--	9,590	9,390	8,030	14,200	6,410
Antimony	SW6010B	mg/Kg	--	--	--	38.4	18.2	12.0	15.2	ND< 6.18
Arsenic	SW6010B	mg/Kg	--	6	33	ND< 4.17	2.65	3.84	ND< 5.85	2.89
Barium	SW6010B	mg/Kg	--	--	--	44.5	ND< 38.1	ND< 36.8	78.6	ND< 30.9
Calcium	SW6010B	mg/Kg	--	--	--	9,020	9,570	5,220	14,300	3,900
Chromium	SW6010B	mg/Kg	--	26	110	21.3	19.8	37.3	29.6	11.6
Cobalt	SW6010B	mg/Kg	--	--	--	10.6	ND< 9.53	ND< 9.21	ND< 14.6	ND< 7.72
Copper	SW6010B	mg/Kg	--	16	110	20.5	17.1	20.5	32.4	10.2
Iron	SW6010B	mg/Kg	--	20,000	40,000	21,900	21,700	25,800	28,000	18,100
Lead	SW6010B	mg/Kg	--	31	250	29.7	17.2	18.1	40.5	15.2
Magnesium	SW6010B	mg/Kg	--	--	--	7,680	8,170	5,400	9,890	4,760
Manganese	SW6010B	mg/Kg	--	460	1,100	497	310	332	1,010	240
Nickel	SW6010B	mg/Kg	--	16	75	17.9	16.7	17.6	22.1	13.7
Potassium	SW6010B	mg/Kg	--	--	--	831	679	630	1,770	ND< 386
Selenium	SW6010B	mg/Kg	--	--	--	ND< 4.2	ND< 3.8	ND< 3.7	ND< 5.8	ND< 3.1
Vanadium	SW6010B	mg/Kg	--	--	--	12.8	11.0	11.4	19.2	ND< 7.72
Zinc	SW6010B	mg/Kg	--	120	820	98.6	84.0	86.6	138	90.5
Mercury	SW7471A	mg/Kg	--	--	--	0.112	ND< 0.0709	ND< 0.0739	0.134	ND< 0.0596

Notes

Only detected analytes reported.

VOCs = Volatile Organic Compounds

SVOCs = Semi-Volatile Organic Compounds

NA = Not Analyzed

ND = Indicates compound was analyzed for, but not detected at or above the reporting limit

J = Concentration detected is below the calibration range

A = Detection limit based on signal-to-noise measurement

B = Less than 10 times higher than method blank level

I = Interference

[a] Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario (1993)

[b] Guideline is for DDT (total)

NEL = No Effects Level

LEL = Lowest Effects Level

SEL = Severe Effects Level

Underlined values exceed either the NEL, LEL, or SEL of the SQG

*Qualifiers are associated with the native isomers used to calculate the Total 2,3,7,8-TCDD Equivalence concentrations. One or more native isomer may be qualified, with one or more qualifier. See laboratory report for details

TABLE 7. SUMMARY OF SEDIMENT ANALYTICAL RESULTS

Pownal Tannery
Pownal, Vermont

Sample ID:						SD-37	SD-36	SD-34	SD-31	SD-30
Sample Collection Date:						6/20/2007	6/20/2007	6/20/2007	6/20/2007	6/20/2007
Analyte	Analytical Method	Units	Sediment Quality Guidelines[a] (SQGs)							
			NEL	LEL	SEL					
Polychlorinated Biphenyls										
(None Detected)	680	µg/Kg	--	--	--	ND	ND	ND	ND	ND
Total Organic Carbon	Lloyd Kahn	mg/Kg	--	10,000	100,000	14,000	1,700	10,200	1,600	2,400
Metals (Full List)										
Aluminum	SW6010B	mg/Kg	--	--	--	11,900	8,610	10,200	7,100	8,650
Antimony	SW6010B	mg/Kg	--	--	--	ND< 8.37	ND< 5.43	ND< 7.39	ND< 6.66	9.12
Arsenic	SW6010B	mg/Kg	--	6	33	ND< 8.37	ND< 5.43	ND< 7.39	2.18	ND< 6.04
Barium	SW6010B	mg/Kg	--	--	--	71.2	ND< 27.2	50.8	ND< 33.3	33.3
Calcium	SW6010B	mg/Kg	--	--	--	11,200	2,600	8,300	8,430	8,360
Chromium	SW6010B	mg/Kg	--	26	110	61.3	16.3	32.7	12.4	20.6
Cobalt	SW6010B	mg/Kg	--	--	--	10.9	7.53	ND< 9.24	ND< 8.3	ND< 7.55
Copper	SW6010B	mg/Kg	--	16	110	33.0	12.0	19.4	9.87	11.6
Iron	SW6010B	mg/Kg	--	20,000	40,000	25,500	21,500	21,500	17,200	22,700
Lead	SW6010B	mg/Kg	--	31	250	46	18	30	6.9	11
Magnesium	SW6010B	mg/Kg	--	--	--	9,470	4,990	7,590	7,100	6,120
Manganese	SW6010B	mg/Kg	--	460	1,100	629	377	406	248	254
Nickel	SW6010B	mg/Kg	--	16	75	20.0	14.7	16.4	11.7	20.3
Potassium	SW6010B	mg/Kg	--	--	--	1,460	761	1,210	891	722
Selenium	SW6010B	mg/Kg	--	--	--	ND< 8.4	ND< 5.4	ND< 7.4	ND< 1.7	ND< 6.0
Vanadium	SW6010B	mg/Kg	--	--	--	14.3	8.17	11.4	ND< 8.33	10.6
Zinc	SW6010B	mg/Kg	--	120	820	138	77.0	101	72.5	101
Mercury	SW7471A	mg/Kg	--	--	--	0.156	ND< 0.0558	ND< 0.0748	0.163	ND< 0.0623
Cyanide	SW9010B	mg/Kg	--	--	--	ND< 1.2	ND< 1.5	ND< 1.5	ND< 1.3	ND< 1.2

Notes:

Only detected analytes reported.

VOCs = Volatile Organic Compounds

SVOCs = Semi-Volatile Organic Compounds

NA = Not Analyzed

ND = Indicates compound was analyzed for, but not detected at or above the reporting limit.

[a] Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario (1993)

[b] Guideline is for DDT (total)

NEL = No Effects Level

LEL = Lowest Effects Level

SEL = Severe Effects Level

Underlined values exceed either the NEL, LEL, or SEL of the SQG.

TABLE 8. SUMMARY OF QA/QC RESULTS

Sediment Sampling

Pownal Tannery,
North Pownal, Vermont

Sample ID:			SD-34	Dup (SD-34)	EB
Sample Collection Date:			6/20/2007	6/20/2007	6/20/2007
Analyte	Analytical Method	Units			
Polychlorinated Biphenyls					
(None Detected)	680	ppb	ND	ND	ND
Total Organic Carbon					
	Lloyd Kahn	ppm	**26,000**	NA	NA
Dioxins					
Total 2,3,7,8-TCDD Equivalence*	8290	ppt	**10,200**	NA	NA
Metals (Full List)					
Aluminum	SW6010B	ppm	**10,200**	**11,800**	ND
Antimony	SW6010B	ppm	ND< 7.39	ND< 8.09	ND
Arsenic	SW6010B	ppm	ND< 7.39	ND< 8.09	ND
Barium	SW6010B	ppm	**50.8**	**59.3**	ND
Calcium	SW6010B	ppm	**8,300**	**7,500**	ND
Chromium	SW6010B	ppm	**32.7**	**33.5**	ND
Cobalt	SW6010B	ppm	ND< 9.24	ND< 10.1	ND
Copper	SW6010B	ppm	**19.4**	**23.1**	**0.0251**
Iron	SW6010B	ppm	**21,500**	**24,900**	ND
Lead	SW6010B	ppm	**30**	**30**	ND
Magnesium	SW6010B	ppm	**7,590**	**8,260**	ND
Manganese	SW6010B	ppm	**406**	**475**	ND
Nickel	SW6010B	ppm	**16.4**	**19.5**	ND
Potassium	SW6010B	ppm	**1,210**	**1,350**	ND
Selenium	SW6010B	ppm	ND< 7.4	ND< 8.1	ND
Vanadium	SW6010B	ppm	**11.4**	**13.0**	ND
Zinc	SW6010B	ppm	**101**	**117**	ND
Mercury	SW7471A	ppm	ND< 0.0748	ND< 0.0765	ND
Cyanide	SW9010B	ppm	ND< 1.5	ND< 1.6	NA

Notes:
Only detected analytes reported.
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
NA = Not Analyzed
ND = Indicates compound was analyzed for, but not detected at or above the reporting limit.

ppb = parts per billion
ppm = parts per million
ppt = parts per trillion

TABLE 8. SUMMARY OF SEDIMENT ANALYTICAL RESULTS

Pownal Tannery
Pownal, Vermont

Sample ID:								SD-37	SD-36	SD-34	SD-31	SD-30
Sample Collection Date:								6/26/2008	6/26/2008	6/26/2008	6/26/2008	6/26/2008
Analyte	Analytical Method	Units	Sediment Quality Guidelines[a] (SQGs) NEL	LEL	SEL	VTDEC Draft Sediment Screening Values						
Polychlorinated Biphenyls												
(None Detected)	680	µg/kg	--	--	--	60		ND	ND	ND	ND	ND
Total Organic Carbon												
	Lloyd Kahn	mg/Kg	--	10,000	100,000	10,000		17,600	920	8,500	22,600	750
Metals (Full List)												
Aluminum	SW6010B	mg/Kg	--	--	--			9,340	7,100	7,550	11,200	5,900
Antimony	SW6010B	mg/Kg	--	--	--	2		ND< 8.0	ND< 6.6	ND< 7.4	ND< 11	ND< 5.9
Arsenic	SW6010B	mg/Kg	--	6	33	10		4.96	ND< 1.66	4.38	5.35	3.91
Barium	SW6010B	mg/Kg	--	--	--			57.7	ND< 33.2	40.6	89.2	ND< 29.5
Beryllium	SW6010B	mg/Kg	--	--	--			0.538	ND< 0.415	ND< 0.461	ND< 0.680	ND< 0.369
Cadmium	SW6010B	mg/Kg	--	0.6	10	1		ND< 1.00	ND< 0.829	ND< 0.923	1.39	ND< 0.738
Calcium	SW6010B	mg/Kg	--	--	--			12,300	4,020	6,860	14,900	21,300
Chromium	SW6010B	mg/Kg	--	26	110	43		21.4	13.8	28.7	25.2	10.7
Cobalt	SW6010B	mg/Kg	--	--	--			ND< 10.0	ND< 8.29	ND< 9.23	ND< 13.6	ND< 7.38
Copper	SW6010B	mg/Kg	--	16	110	36		28.8	14.7	22.5	48.1	13.7
Iron	SW6010B	mg/Kg	--	20,000	40,000	20,000		22,600	20,000	20,700	25,200	17,600
Lead	SW6010B	mg/Kg	--	31	250	35.8		23	14	25	50	13
Magnesium	SW6010B	mg/Kg	--	--	--			7,830	4,860	5,900	7,570	13,400
Manganese	SW6010B	mg/Kg	--	460	1,100	460		787	417	361	1,000	260
Nickel	SW6010B	mg/Kg	--	16	75	23		19.8	16.8	17.3	28.0	14.4
Potassium	SW6010B	mg/Kg	--	--	--			1,330	706	845	1,820	603
Selenium	SW6010B	mg/Kg	--	--	--			ND< 2.0	ND< 1.7	ND< 1.8	ND< 2.7	ND< 1.5
Silver	SW6010B	mg/Kg				1.0		ND< 2.80	ND< 2.32	ND< 2.58	ND< 3.81	ND< 2.07
Sodium	SW6010B	mg/Kg						ND< 501	ND< 415	ND< 461	ND< 680	ND< 369
Thallium	SW6010B	mg/Kg						ND< 2.0	ND< 1.7	ND< 1.8	ND< 2.7	ND< 1.5
Vanadium	SW6010B	mg/Kg	--	--	--			13.3	ND< 8.29	9.48	ND< 15.8	7.62
Zinc	SW6010B	mg/Kg	--	120	820	121		112	76.6	102	162	98.9
Mercury	SW7471A	mg/Kg	--	--	--			0.116	0.114	0.142	0.182	0.0784
Cyanide	SW9010B	mg/Kg	--	--	--			ND< 1.5	ND< 1.3	ND< 1.5	ND< 2.1	ND< 1.2

Notes:
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
NA = Not Analyzed
ND = Indicates compound was analyzed for, but not detected at or above the reporting limit

[a] Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario (1993)
[b] Guideline is for DDT (total)
NEL = No Effects Level
LEL = Lowest Effects Level
SEL = Severe Effects Level
Underlined values exceed either the NEL, LEL, or SEL of the SQG

TABLE 9. SUMMARY OF QA/QC RESULTS

Sediment Sampling

Pownal Tannery,
North Pownal, Vermont

Sample ID:			SD-34	Dup (SD-34)	EB
Sample Collection Date:			6/26/2008	6/26/2008	6/26/2008
Analyte	Analytical Method	Units			
Polychlorinated Biphenyls					
(None Detected)	680	ppb	ND	ND	ND
Total Organic Carbon					
	Lloyd Kahn	ppm	8,500	NA	NA
Metals (Full List)					
Aluminum	SW6010B	ppm	7,550	7,890	ND
Antimony	SW6010B	ppm	ND< 7.4	ND< 6.6	ND
Arsenic	SW6010B	ppm	4.38	4.53	ND
Barium	SW6010B	ppm	40.6	47.0	ND
Beryllium	SW6010B	ppm	ND< 0.461	ND< 0.413	ND
Cadmium	SW6010B	ppm	ND< 0.923	ND< 0.825	ND
Calcium	SW6010B	ppm	6,860	6,890	ND
Chromium	SW6010B	ppm	28.7	20.9	ND
Cobalt	SW6010B	ppm	ND< 9.23	ND< 8.25	ND
Copper	SW6010B	ppm	22.5	27.0	ND
Iron	SW6010B	ppm	20,700	21,000	ND
Lead	SW6010B	ppm	25	23	ND
Magnesium	SW6010B	ppm	5,900	5,820	ND
Manganese	SW6010B	ppm	361	357	ND
Nickel	SW6010B	ppm	17.3	16.6	ND
Potassium	SW6010B	ppm	845	904	ND
Selenium	SW6010B	ppm	ND< 1.8	ND< 1.7	ND
Silver	SW6010B	ppm	ND< 2.58	ND< 2.31	ND
Sodium	SW6010B	ppm	ND< 461	ND< 413	ND
Thallium	SW6010B	ppm	ND< 1.8	ND< 1.7	ND
Vanadium	SW6010B	ppm	9.48	10.2	ND
Zinc	SW6010B	ppm	102	94.9	ND
Mercury	SW7471A	ppm	0.142	0.118	ND
Cyanide	SW9010B	ppm	ND< 1.5	ND< 1.5	ND

Notes:
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
NA = Not Analyzed
ND = Indicates compound was analyzed for, but not detected at or above the reporting limit.

ppb = parts per billion
ppm = parts per million
ppt = parts per trillion

Residential Data

Table 9. SUMMARY OF GROUNDWATER MONITORING RESULTS
Residential Wells

Pownal Tannery
Pownal, Vermont

Sample ID						**Lubeck**	**Dupuis**
Sample Collection Date						**9/21/02005**	**9/21/02005**
		Groundwater Quality Standards					
Parameter	**Analytical Method**	**Primary**		**Secondary**			
		VGES	**PAL**	**VGES**	**PAL**		
Final Field Parameters							
pH (su)	Field	-	-	-	-	6.6	6.64
Specific Conductance (us/cm3)	Field	-	-	-	-	440.3	511.8
Temperature C	Field	-	-	-	-	15.76	15.58
VOCs							
(none detected)	SW8260B	Not Applicable				ND	ND
SVOCs							
(none detected)	SW8270C	Not Applicable				ND	ND
Metals							
Antimony	SW6020A	6	3	-	-	<10	<10
Arsenic	SW6020A	10	1	-	-	<1	<1
Barium	SW6020A	2000	1000	-	-	14.2	15.8
Chromium	SW6020A	100	50	-	-	<5	<5
Lead	SW6020A	15	1.5	-	-	<1	<1
Manganese	SW6020A	840		-	-	<5	<5
Zinc	SW6020A	-	-	5000	2500	<10	136

Notes:
All resultes in micrograms per liter, unless otherwise noted
Only detected analytes reported
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
VGES = Vermont Groundwater Enforcement Standard
PAL = Preventative Action Limit
ND = Not detected

Table 9. SUMMARY OF GROUNDWATER MONITORING RESULTS
Residential Wells

Pownal Tannery
Pownal, Vermont

Sample ID						**Lubeck**	**Bisson**
Sample Collection Date						**9/27/2006**	**9/27/2006**
		Groundwater Quality Standards					
Parameter	**Analytical Method**	**Primary**		**Secondary**			
		VGES	**PAL**	**VGES**	**PAL**		
Final Field Parameters							
pH (su)	Field	-	-	-	-	6.8	6.38
Specific Conductance (us/cm3)	Field	-	-	-	-	433	568
Temperature C	Field	-	-	-	-	14.34	15.68
VOCs							
(none detected)	SW8260B	Not Applicable				ND	ND
SVOCs							
(none detected)	SW8270C	Not Applicable				ND	ND
Metals							
Antimony	SW6020A	6	3	-	-	<10	<10
Arsenic	SW6020A	10	1	-	-	<1	<1
Barium	SW6020A	2000	1000	-	-	**13.8**	**32.3**
Chromium	SW6020A	100	50	-	-	<5	<5
Lead	SW6020A	15	1.5	-	-	**1.24**	**1.08**
Manganese	SW6020A	840		-	-	<5	<5
Zinc	SW6020A	-	-	5000	2500	**23.9**	<10

Notes:
All resultes in micrograms per liter, unless otherwise noted
Only detected analytes reported
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds

VGES = Vermont Groundwater Enforcement Standard
PAL = Preventative Action Limit
ND = Not detected

Table 9. SUMMARY OF GROUNDWATER MONITORING RESULTS
Residential Wells

Pownal Tannery
Pownal, Vermont

Sample ID						Lubeck	Bisson	DuPuis
Sample Collection Date & Time						9/20/2007 : 1130	9/20/2007 : 1210	9/20/2007 : 1153
		Groundwater Quality Standards						
Parameter	Analytical Method	Primary		Secondary				
		VGES	PAL	VGES	PAL			
Final Field Parameters								
pH (su)	Field	-	-	-	-	7.19	6.82	7.11
Specific Conductance (us/cm3)	Field	-	-	-	-	383.1	592	339.9
Temperature C	Field	-	-	-	-	12.5	13.9	15.2
VOCs								
(none detected)	SW8260B	Not Applicable				ND	ND	ND
SVOCs								
(none detected)	SW8270C	Not Applicable				ND	ND	ND
Metals								
Antimony	SW6020A	6	3	-	-	<20	<20	<20
Arsenic	SW6020A	10	1	-	-	<5	<5	<5
Barium	SW6020A	2000	1000	-	-	<200	<200	<200
Chromium	SW6020A	100	50	-	-	<10	<10	<10
Lead	SW6020A	15	1.5	-	-	<5	<5	<5
Manganese	SW6020A	840		-	-	<15	<15	<15
Zinc	SW6020A	-	-	5000	2500	<20	<10	**561**

Notes:
All resultes in micrograms per liter, unless otherwise noted
Only detected analytes reported
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
VGES = Vermont Groundwater Enforcement Standard
PAL = Preventative Action Limit
ND = Not detected

Table 6. SUMMARY OF GROUNDWATER MONITORING RESULTS
Residential Wells

Pownal Tannery
Pownal, Vermont

Sample ID						Lubeck	Bisson	DuPuis
Sample Collection Date & Time						9/25/2008	11/5/2008	9/25/2008
		Groundwater Quality Standards						
Parameter	Analytical Method	Primary		Secondary				
		VGES	PAL	VGES	PAL			
Final Field Parameters								
pH (su)	Field	-	-	-	-	6.54	6.28	6.78
Specific Conductance (us/cm3)	Field	-	-	-	-	8.2	485.1	1.8
Temperature C	Field	-	-	-	-	14.2	13.9	15.9
VOCs							ND	
Benzene	SW8260B	5	0.5			<1	ND	ND
Toluene	SW8260B	1000	500			1.1	ND	1.1
SVOCs								
(none detected)	SW8270C	Not Applicable				NS	NS	NS
Metals								
Antimony	SW6020A	6	3	-	-	<10	<10	<10
Arsenic	SW6020A	10	1	-	-	<1	<1	<1
Barium	SW6020A	2000	1000	-	-	13.9	26.4	13.5
Chromium	SW6020A	100	50	-	-	<5	<5	<5
Lead	SW6020A	15	1.5	-	-	1.03	1.03	1.09
Manganese	SW6020A	840		-	-	<5	<5	<5
Zinc	SW6020A	-	-	5000	2500	<50	<50	**407**

Notes:
All resultes in micrograms per liter, unless otherwise noted
Only detected analytes reported
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds

VGES = Vermont Groundwater Enforcement Standard
PAL = Preventative Action Limit
ND = Not detected
NS = Not sampled

Attachment 6
Historical Gas Monitoring Concentrations – Former Lagoon Area

Table 10. SUMMARY OF GAS MONITORING RESULTS

Lagoon Area
Pownal Tannery
Pownal, Vermont

		Sample Date				
Sample Location	Outside Ambient	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		11:45	15:18	9:20	14:58	11:55
VOCs by PID(10.2eV)	(ppm)	0	0	0	0.8	0
O2	(%)	15	21.2	20.8	20.8	20.8
CH4	(%)	1.6	0	0	0	0
H2S	(ppm)	0	0	0	0	0
Barometric Pressure	**hPa**	1027	1020.3	1017.3	1012.8	1018
Sample Location	GP-1	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		12:48	15:23	9:23	15:10	12:22
VOCs by PID(10.2eV)	(ppm)	0	0.3	0	0	0.9
O2	(%)	9.6	7.2	14.3	1.4	4.2
CH4	(%)	1.35	0.75	0	0.7	>5.00
H2S	(ppm)	0	0	0	0	0
Barometric Pressure	**hPa**	1027	1020.3	1017.3	1012.8	1018
Sample Location	GP-2	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		12:42	15:28	9:30	15:17	12:31
VOCs by PID(10.2eV)	(ppm)	6	1.4	0	1.6	2.6
O2	(%)	15.7	9.9	18.4	5.7	4.8
CH4	(%)	0	0	0	0.2	0.15
H2S	(ppm)	0	0	0	0	0
Barometric Pressure	**hPa**	1027	1020.3	1017.3	1012.8	1018
Sample Location	GP-3	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		12:27	15:36	9:38	15:25	12:38
VOCs by PID(10.2eV)	(ppm)	12	3.1	0	0.8	1.7
O2	(%)	1.6	3	19.1	2.9	2.7
CH4	(%)	0	0	0	0.2	0.15
H2S	(ppm)	0	0	0	0	0
Barometric Pressure	**hPa**	1027	1020.3	1017.3	1012.8	1018
Sample Location	GV-1	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		NM	15:46	9:50	15:38	12:49
VOCs by PID(10.2eV)	(ppm)	NM	0	0	0	0
O2	(%)	NM	14.2	13.4	1.6	9.9
CH4	(%)	NM	0.55	0	0.9	0.15
H2S	(ppm)	NM	0	0	6	0
Barometric Pressure	**hPa**		1020.3	1017.3	1012.8	1018
Sample Location	GV-2	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		NM	15:52	9:58	15:45	NM
VOCs by PID(10.2eV)	(ppm)	NM	0	0	0	NM
O2	(%)	NM	15.9	15.3	7.1	NM
CH4	(%)	NM	4.45	0.85	4.45	NM
H2S	(ppm)	NM	0	0	0	NM
Barometric Pressure	**hPa**		1020.3	1017.3	1012.8	1018

Table 10. SUMMARY OF GAS MONITORING RESULTS

Lagoon Area
Pownal Tannery
Pownal, Vermont

Sample Location	GV-3	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		NM	15:57	10:05	15:51	NM
VOCs by PID(10.2eV)	(ppm)	NM	0	0	0	NM
O2	(%)	NM	9.9	10.4	1.4	NM
CH4	(%)	NM	>5.0	0.4	>5.0	NM
H2S	(ppm)	NM	0	0	12	NM
Barometric Pressure	hPa		1020.3	1017.3	1012.8	1018

Sample Location	GV-4	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		13:05	16:02	10:15	15:57	NM
VOCs by PID(10.2eV)	(ppm)	0	0	0	0	NM
O2	(%)	4	9	14.4	0.6	NM
CH4	(%)	>5	>5.0	0.55	>5.00	NM
H2S	(ppm)	0	0	0	5	NM
Barometric Pressure	hPa	1027	1020.3	1017.3	1012.8	1018

Sample Location	GV-5	2/3/2005	3/27/2005	5/10/2005	6/30/2005	9/21/2005
Time		NM	16:09	10:22	16:05	12:59
VOCs by PID(10.2eV)	(ppm)	NM	0	0	0	0
O2	(%)	NM	13.3	10.4	4.3	6.8
CH4	(%)	NM	4.3	>5.0	>5.0	>5.0
H2S	(%)	NM	0	0	0	0
Barometric Pressure	hPa		1020.3	1017.3	1012.8	1018

Notes:
Units as indicated
O2, CH4, H2S measured w/ MSA Passport multi-gas meter
NM = Not Measured
Barometric pressure as reported at the Bennington State Airport

Table 10. SUMMARY OF GAS MONITORING RESULTS

Lagoon Area
Pownal Tannery
Pownal, Vermont

		Sample Date	
Sample Location	Outside Ambient	4/28/2006	9/27/2006
Time		10:12	12:03
VOCs by PID(10.2eV)	**(ppm)**	0.7	0
O2	**(%)**	21.5	20.9
CH4	**(%)**	0	0
H2S	**(ppm)**	0	0
Barometric Pressure	**hPa**	1024	1016
Sample Location	GP-1	4/28/2006	9/27/2006
Time		10:19	12:06
VOCs by PID(10.2eV)	**(ppm)**	2.2	4.2
O2	**(%)**	19.5	8.7
CH4	**(%)**	0	0
H2S	**(ppm)**	0	0
Barometric Pressure	**hPa**	1024	1016
Sample Location	GP-2	4/28/2006	9/27/2006
Time		10:27	12:13
VOCs by PID(10.2eV)	**(ppm)**	2.2	4.2
O2	**(%)**	14.4	4.1
CH4	**(%)**	0	0.15
H2S	**(ppm)**	0	0
Barometric Pressure	**hPa**	1024	1016
Sample Location	GP-3	4/28/2006	9/27/2006
Time		10:32	12:20
VOCs by PID(10.2eV)	**(ppm)**	3	4.2
O2	**(%)**	5.1	0.6
CH4	**(%)**	0	0.15
H2S	**(ppm)**	0	0
Barometric Pressure	**hPa**	1024	1016
Sample Location	GV-1	4/28/2006	9/27/2006
Time		10:45	12:32
VOCs by PID(10.2eV)	**(ppm)**	0	0
O2	**(%)**	21	15.1
CH4	**(%)**	0	0.15
H2S	**(ppm)**	0	0
Barometric Pressure	**hPa**	1024	1016
Sample Location	GV-2	4/28/2006	9/27/2006
Time		10:50	12:54
VOCs by PID(10.2eV)	**(ppm)**	0	2.1
O2	**(%)**	20.6	4
CH4	**(%)**	0	0.15
H2S	**(ppm)**	0	0
Barometric Pressure	**hPa**	1024	1016

Table 10. SUMMARY OF GAS MONITORING RESULTS

Lagoon Area
Pownal Tannery
Pownal, Vermont

Sample Location	GV-3	4/28/2006	9/27/2006
Time		10:56	12:59
VOCs by PID(10.2eV)	(ppm)	0	0
O2	(%)	20.9	10
CH4	(%)	0	0.2
H2S	(ppm)	0	0
Barometric Pressure	hPa	1024	1016

Sample Location	GV-4	4/28/2006	9/27/2006
Time		11:00	13:03
VOCs by PID(10.2eV)	(ppm)	0	0
O2	(%)	21.2	4.5
CH4	(%)	0	2.3
H2S	(ppm)	0	0
Barometric Pressure	hPa	1024	1016

Sample Location	GV-5	4/28/2006	9/27/2006
Time		11:05	13:11
VOCs by PID(10.2eV)	(ppm)	0	0
O2	(%)	18.1	2.8
CH4	(%)	2.25	0.55
H2S	(%)	0	0
Barometric Pressure	hPa	1024	1016

Notes:
Units as indicated
O2, CH4, H2S measured w/ MSA Passport multi-gas meter
NM = Not Measured
Barometric pressure as reported at the Bennington State Airport

Table 10. SUMMARY OF GAS MONITORING RESULTS
Lagoon Area

		Sample Date
Sample Location	Outside Ambient	9/18/2007
Time		10:12
VOCs by PID(10.2eV)	(ppm)	0.7
O2	(%)	21.5
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1033.1
Sample Location	GP-1	9/18/2007
Time		10:19
VOCs by PID(10.2eV)	(ppm)	2.2
O2	(%)	19.5
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1033.1
Sample Location	GP-2	9/18/2007
Time		10:27
VOCs by PID(10.2eV)	(ppm)	2.2
O2	(%)	14.4
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1032.7
Sample Location	GP-3	9/18/2007
Time		10:32
VOCs by PID(10.2eV)	(ppm)	3
O2	(%)	5.1
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1032.7
Sample Location	GV-1	9/18/2007
Time		10:45
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	21
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1032.5
Sample Location	GV-2	9/18/2007
Time		10:50
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	20.6
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1032.4
Sample Location	GV-3	9/18/2007
Time		10:56
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	20.9
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1032.4
Sample Location	GV-4	9/18/2007
Time		11:00
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	21.2
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1032.4
Sample Location	GV-5	9/18/2007
Time		11:05
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	18
CH4	(%)	2.25
H2S	(%)	0
Barometric Pressure	hPa	1032.4

Notes:
Units as indicated
O2, CH4, H2S measured w/ MSA Passport multi-gas meter
NM = Not Measured
Barometric pressure as reported at the Bennington State Airport

Table 10. SUMMARY OF GAS MONITORING RESULTS
Lagoon Area

		Sample Date
Sample Location	Outside Ambient	9/25/2008
Time		11:50
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	21.1
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1031.9
Sample Location	GP-1	9/25/2008
Time		11:53
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	15
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1031.9
Sample Location	GP-2	9/25/2008
Time		11:58
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	16.5
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1031.9
Sample Location	GP-3	9/25/2008
Time		12:03
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	4.8
CH4	(%)	0.15
H2S	(ppm)	0
Barometric Pressure	hPa	1031.9
Sample Location	GV-1	9/25/2008
Time		12:51
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	15.8
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1031.6
Sample Location	GV-2	9/25/2008
Time		12:54
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	4.6
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1031.6
Sample Location	GV-3	9/25/2008
Time		13:00
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	13.4
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1031.6
Sample Location	GV-4	9/25/2008
Time		13:03
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	10
CH4	(%)	0
H2S	(ppm)	0
Barometric Pressure	hPa	1031.6
Sample Location	GV-5	9/25/2008
Time		13:10
VOCs by PID(10.2eV)	(ppm)	0
O2	(%)	2.2
CH4	(%)	0.15
H2S	(%)	0
Barometric Pressure	hPa	1031.6

Notes:
Units as indicated
O2, CH4, H2S measured w/ MSA Passport multi-gas meter
NM = Not Measured
Barometric pressure as reported at the Bennington State Airport